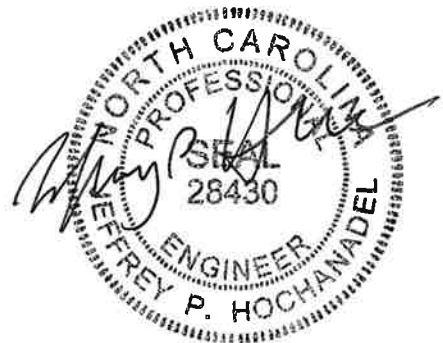


Robertson Street Assemblage

Traffic Impact Analysis

Knightdale, North Carolina

October 2022



Prepared for:

10/26/22

Natelli Communities

TIMMONS GROUP

YOUR VISION ACHIEVED THROUGH OURS.



Contact: Jeff Hochanadel, PE, PTOE

5410 Trinity Road, Suite 102 • Raleigh, NC 27607
(919) 866-4511 phone • (919) 859-5663 fax
www.timmons.com

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1 INTRODUCTION

This report presents the proposed Robertson Street Assemblage residential and commercial development Traffic Impact Analysis (TIA) findings. The development will be located north and south of Robertson Street (east of North First Avenue), in Knightdale, NC (see **Figure 1-1**). The proposed development will be built in one phase and will consist of the following:

- 176 townhouse units
- 491 single family houses
- 3,000 SF daycare center
- 5,000 SF medical / dental office building
- 7,000 SF general office building
- 2,000 SF high-turnover sit-down restaurant
- 2,000 SF high-turnover sit-down restaurant

Development construction is proposed to be completed by 2027. Analyses will be performed for the first and tenth years after the build-out year, or 2028 and 2038.

Analyses were completed for the following scenarios:

- 2022 Existing;
- 2028 Background;
- 2028 Build (Background + site trips);
- 2028 Build + Improvements (Background + site trips); and
- 2038 Build (Background + site trips).

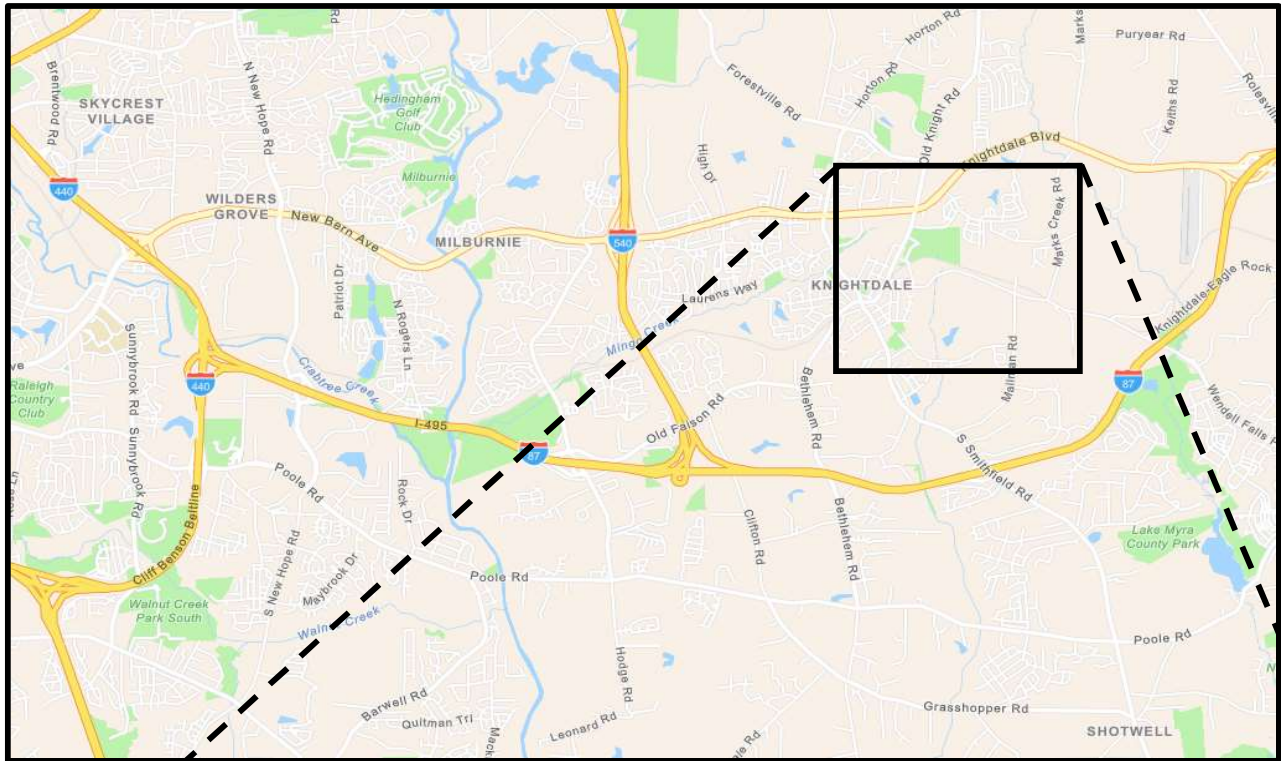
The TIA's purpose is to verify that the existing geometry provided within the study area is sufficient to accommodate the projected traffic volumes, and to determine what, if any, improvements are necessary at the proposed site driveway connections.

The following steps were taken to determine the potential traffic impacts associated with this project:

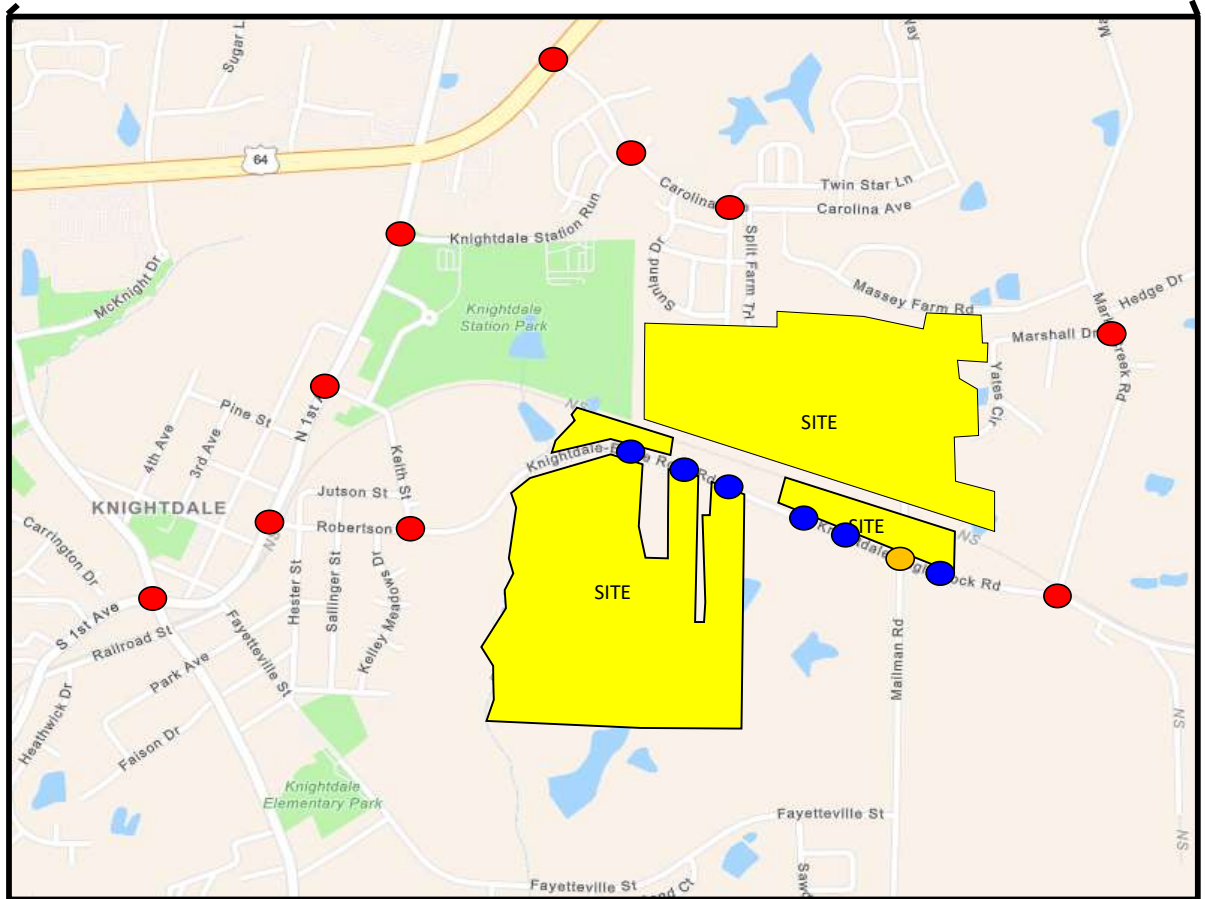
1. Data Collection – AM (7:00 – 9:00) and PM (4:00 – 6:00) peak hour turning movement counts were collected in December 2021, January 2022, May 2022, and June 2022 at the following intersections:
 - US-64 Business (Knightdale Boulevard) / Carolinian Avenue;
 - Knightdale Station Run / Carolinian Avenue;
 - Knightdale Station Run / First Avenue;
 - Carolinian Avenue / Heartland Flyer Drive / Twin Star Lane;
 - Marks Creek Road / Marshall Drive;
 - First Avenue / Poplar Street;
 - SR-2500 (Robertson Street) / First Avenue;
 - SR-2500 (Robertson Street) / Keith Street;
 - SR-2500 (Robertson Street) / SR-2500 (Knightdale Eagle Rock Road) / SR-2514 (Mailman Road);
 - SR-2501 (Knightdale Eagle Rock Road) / SR-2500 (Marks Creek Road); and
 - SR-2233 (Smithfield Road) / First Avenue.
2. Trip Generation/Future Traffic – Traffic generated by the proposed development was estimated using the 10th Edition of the Institute of Transportation Engineers' *Trip Generation Manual*. The proposed development trip generation was calculated following the NCDOT trip generation standards and practices. Projected 2028 traffic volumes were calculated using a 3% ambient growth rate where projected 2038 traffic volumes were calculated using a 1% growth rate between 2028 and 2038. Per

the scoping information (see **Appendix A**), there are currently two (2) approved developments within the project study area, Smithfield Mixed Use Development and The Collection Development.

3. Trip Distribution and Projections – The site-generated trip distribution was based on the existing area traffic distribution and Engineering judgement. It was assumed, for purposes of analysis, that projected trips would follow similar patterns as existing traffic.
4. Traffic Capacity Analysis – Level of service analyses were performed using SYNCHRO Version 10.3 for the following intersections:
 - US-64 Business (Knightdale Boulevard) / Carolinian Avenue;
 - Knightdale Station Run / Carolinian Avenue;
 - Knightdale Station Run / First Avenue;
 - Carolinian Avenue / Heartland Flyer Drive / Twin Star Lane;
 - Marks Creek Road / Marshall Drive;
 - First Avenue / Poplar Street;
 - SR-2500 (Robertson Street) / First Avenue;
 - SR-2500 (Robertson Street) / Keith Street;
 - SR-2500 (Robertson Street) / Site Access 1;
 - SR-2500 (Robertson Street) / Site Access 2;
 - SR-2500 (Robertson Street) / Site Access 3;
 - SR-2500 (Robertson Street) / Site Access 4;
 - SR-2500 (Robertson Street) / Site Access 5;
 - SR-2500 (Robertson Street) / SR-2500 (Knightdale Eagle Rock Road) / SR-2514 (Mailman Road) / Site Access 6;
 - SR-2500 (Robertson Street) / Site Access 7;
 - SR-2501 (Knightdale Eagle Rock Road) / SR-2500 (Marks Creek Road); and
 - SR-2233 (Smithfield Road) / First Avenue.
5. Review of Proposed Improvements – Roadway improvements proposed to accommodate projected site-generated traffic were evaluated.



NOT TO SCALE



Legend

- = Study Area Intersection
- = Driveway Intersection
- = Study Area / Driveway Intersection

Robertson Street Assemblage Traffic Impact Analysis Site Location Map

Figure
1-1

2 EXISTING INFORMATION

The proposed development will be located north and south of Robertson Street (east of First Avenue), in Knightdale, NC, as shown on **Figure 1-1**.

2.1 STUDY LIMITS

Access to the proposed northern residential site section will be provided by connections to two (2) existing roads, Heartland Flyer Drive and Marshall Drive.

Access to the proposed southern residential site section will be provided via three (3) full access connections to SR-2500 (Robertson Street).

- **Site Access 1** will connect to Robertson Street approximately 2,630 feet (C/L to C/L) west of Mailman Road.
- **Site Access 2** will connect to Robertson Street approximately 2,200 feet (C/L to C/L) west of Mailman Road.
- **Site Access 3** will connect to Robertson Street approximately 1,400 feet (C/L to C/L) west of Mailman Road.

Access to the proposed commercial site section will be provided via four (4) full access connections to SR-2500 (Robertson Street).

- **Site Access 4** will connect to Robertson Street approximately 1,060 feet (C/L to C/L) west of Mailman Road.
- **Site Access 5** will connect to Robertson Street approximately 850 feet (C/L to C/L) west of Mailman Road.
- **Site Access 6** will connect to Robertson Street directly across from Mailman Road.
- **Site Access 7** will connect to Robertson Street approximately 285 feet (C/L to C/L) east of Mailman Road.

Site accesses are shown graphically in **Figure 1-1** and the preliminary site layout in **Figure 2-1** (all figures are located at the end of their respective chapter).

The study limits include the following seventeen (17) intersections:

- US-64 Business (Knightdale Boulevard) / Carolinian Avenue;
- Knightdale Station Run / Carolinian Avenue;
- Knightdale Station Run / First Avenue;
- Carolinian Avenue / Heartland Flyer Drive / Twin Star Lane;
- Marks Creek Road / Marshall Drive;
- First Avenue / Poplar Street;
- SR-2500 (Robertson Street) / First Avenue;
- SR-2500 (Robertson Street) / Keith Street;
- SR-2500 (Robertson Street) / Site Access 1;
- SR-2500 (Robertson Street) / Site Access 2;
- SR-2500 (Robertson Street) / Site Access 3;
- SR-2500 (Robertson Street) / Site Access 4;
- SR-2500 (Robertson Street) / Site Access 5;
- SR-2500 (Knightdale Eagle Rock Road) / SR-2514 (Mailman Road) / Site Access 6;
- SR-2500 (Robertson Street) / Site Access 7;

- SR-2500 (Robertson Street) / SR-2501 (Knightdale Eagle Rock Road) / SR-2500 (Marks Creek Road); and
- SR-2233 (Smithfield Road) / First Avenue.

2.2 EXISTING ROADWAYS

US-64 Business (Knightdale Boulevard) is a four-lane divided facility that runs approximately east-west within the study area. The facility, classified as a principal arterial, connects to Wendell in the east and Raleigh in the west. Knightdale Boulevard has a posted 45-mph speed limit. Per 2020 NCDOT Average Annual Daily Traffic (AADT) maps, Knightdale Boulevard carries 16,000 vehicles per day (VPD) east of First Avenue.

Carolinian Avenue is a two-lane divided facility that runs north-south at Knightdale Boulevard and east-west at Heartland Flyers Drive. The facility, classified as a local roadway, connects to Business US-64 (Knightdale Boulevard) and has a posted 25-mph speed limit. No AADT data is available for this facility.

Knightdale Station Run is a two-lane undivided facility that runs approximately east-west within the study area. The facility, classified as a local roadway, has a posted 25-mph speed limit. No AADT data is available for this facility.

Heartland Flyer Drive is a two-lane undivided facility that runs approximately north-south within the study area. The facility, classified as a local roadway, connects to Carolinian Avenue to the north. Heartland Flyer Drive has a posted 25-mph speed limit. No AADT data is available for this facility.

Twin Star Lane is a two-lane undivided facility that connects to Carolinian Avenue. The facility, classified as a local roadway, has a posted 25-mph speed limit. No AADT data is available for this facility.

SR-2049 (First Avenue) is a two-lane facility that runs approximately north-south within the study area. The facility, classified as a major collector, has a posted 25-mph speed limit. Per 2020 NCDOT AADT maps, First Avenue carries 6,300 VPD south of Knightdale Boulevard.

Poplar Street is a two-lane undivided facility that runs approximately east-west within the study area. The facility, classified as a local roadway, has a posted 15-mph speed limit. No AADT data is available for this facility.

Keith Street is a two-lane undivided facility that runs approximately north-south within the study area. The facility, classified as a local roadway, has a posted 25-mph speed limit. No AADT data is available for this facility.

SR-2500 (Robertson Street) is a two-lane facility that runs approximately east-west within the study area. The facility, classified as a major collector, has a variable posted speed limit, ranging from 25-mph in the west, 35-mph in the middle, and 45-mph in the east. Per 2020 NCDOT AADT maps, Robertson Street carries 2,600 VPD, east of First Avenue.

SR-2501 (Knightdale Eagle Rock Road) is a two-lane divided facility that runs approximately east-west within the study area. The facility, classified as major collector, connects to Robertson Street at Mailman Road. Knightdale Eagle Rock Road has a posted 45-mph speed limit. Per 2020 NCDOT AADT maps, Knightdale Eagle Rock Road carries 2,600 VPD.

SR-2500 (Marks Creek Road) is a two-lane divided facility that runs approximately north-south within the study area. The facility, classified as a local roadway, has a posted 45-mph speed limit. Per 2020 NCDOT AADT maps, Marks Creek Road carries 500 VPD, north of Knightdale Eagle Rock Rd.

Marshall Drive is a two-lane undivided facility that runs approximately east-west within the study area. The facility, classified as a local roadway, has a posted 25-mph speed limit. No AADT data is available for this facility.

SR-2514 (Mailman Road) is a two-lane facility that runs approximately north-south within the study area. The facility, classified as a local roadway, has no posted speed limit. Per the NCDOT Statutory Speed Limit Map, the assumed speed limit is 55-mph. Per 2020 NCDOT AADT maps, Mailman Road carries 500 VPD, south of Robertson Street.

SR-2233 (Smithfield Road) is a two-lane facility that runs approximately north-south within the study area. The facility, classified as a minor arterial, has a posted 35-mph speed limit. Per 2020 NCDOT AADT maps, Smithfield Road carries 6,100 VPD, south of First Avenue.

2.3 EXISTING INTERSECTIONS

Using available aerial imagery and site visits, Timmons Group compiled the existing geometry for each of the study area intersections. The existing intersection geometry is shown on **Figure 2-2**.

Knightdale Boulevard / Carolinian Avenue is a three-phased signalized T-intersection with protected / permissive westbound left-turn phasing. The northbound approach consists of two exclusive left-turn lanes and an exclusive right-turn lane. The eastbound approach consists of an exclusive U-turn lane, two through lanes, and an exclusive right-turn lane. The westbound approach consists of an exclusive left-turn lane and two through lanes.

Knightdale Station Run / Carolinian Avenue is a single-lane roundabout. The north, south, east, and westbound approaches consist of a single right-turn only lane.

First Avenue / Knightdale Station Run is an unsignalized T-intersection with the westbound Knightdale Station Run approach encountering the stop condition. The northbound approach consists of a shared through / right-turn lane. The southbound approach consists of an exclusive left-turn lane and a single through lane. The westbound approach consists of exclusive left and right-turn lanes.

Carolinian Avenue / Heartland Flyer Drive / Twin Star Lane is an unsignalized intersection with the northbound Heartland Flyer Drive and southbound Twin Star Lane approaches encountering the stop condition. All four approaches consist of a single shared left / through / right-turn lane.

Marshall Drive / Marks Creek Road is an unsignalized T-intersection with the eastbound Marshall Drive approach encountering the stop condition. The northbound approach consists of a shared through / left-turn lane. The southbound approach consists of a shared through / right-turn lane. The eastbound approach consists of a shared left / right-turn lane.

First Avenue / Poplar Street is an unsignalized T-intersection with the westbound Poplar Street approach encountering the stop condition. The northbound approach consists of a shared through / right-turn lane. The southbound approach consists of a shared through / left-turn lane. The westbound Poplar Street approach consists of a shared left / right-turn lane.

Robertson Street / First Avenue is an unsignalized T-intersection with the westbound Robertson Street approach encountering the stop condition. The northbound approach consists of a shared through / right-turn lane. The southbound approach consists of a shared through / left-turn lane. The westbound approach consists of a shared left / right-turn lane.

Robertson Street / Keith Street is an unsignalized T-intersection with the southbound approach encountering the stop condition. The southbound approach consists of a shared left / right-turn lane. The eastbound approach consists of a shared through / left-turn lane. The westbound approach consists of a shared through / right-turn lane.

Robertson Street / Knightdale Eagle Rock Road / Mailman Road is an unsignalized T-intersection with the northbound approach encountering the stop condition. The northbound approach consists of a shared left / right-turn lane. The eastbound Robertson Street approach consists of a shared through / right-turn lane. The westbound Knightdale Eagle Rock Road approach consists of a shared through / left-turn lane.

Knightdale Eagle Rock Road / Marks Creek Road is an unsignalized T-intersection with the southbound approach encountering the stop condition. The southbound approach consists of a shared left / right-turn lane. The eastbound approach consists of a shared through / left-turn lane. The westbound approach consists of a shared through / right-turn lane.

Smithfield Road / First Avenue is a two-phased signalized intersection. All four approaches consist of a shared left / through / right-turn lane.

2.4 TRAFFIC VOLUMES

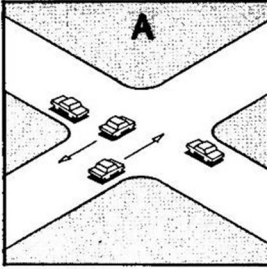
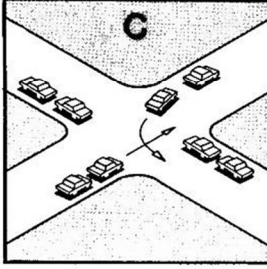
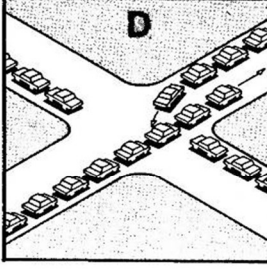
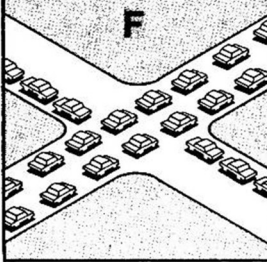
Timmons Group calculated peak hour volumes at the study area intersections using the collected AM (7:00 a.m. – 9:00 a.m.) and PM (4:00 p.m. – 6:00 p.m.) peak period turning movements counts undertaken in December 2021, January 2022, May 2022, and June 2022. Collected traffic count data is summarized in **Figure 2-3**. The complete traffic count data is found in **Appendix B**.

2.5 CAPACITY ANALYSIS

Using field observations, aerial photography, and traffic count data, traffic operations were analyzed during 2022 (existing), 2028 (without and with the proposed development site trips), and 2038 (with the proposed development site trips).

Capacity analysis allows traffic engineers to determine the impacts of traffic on the surrounding roadway network. The Transportation Research Board's (TRB) *Highway Capacity Manual* (HCM) methodologies govern how the capacity analyses are conducted and how the results are interpreted. There are six letter grades of Levels of Service (LOS) from A to F, with LOS A representing the best operating conditions and LOS F the worst operating conditions. At signalized intersections, an overall intersection LOS E is generally considered unacceptable. At unsignalized intersections, a LOS E is generally considered acceptable only if the side street encounters delay. Nevertheless, side streets typically function at a LOS F during peak traffic periods, because the traffic volumes often do not warrant a traffic signal to assist side street traffic. **Table 2-1** shows in detail how each of these levels of service are interpreted.

Table 2-1: Level of Service Definitions

Level of Service	Roadway Segments or Controlled Access Highways	Intersections	
A	Free flow, low traffic density.	No vehicle waits longer than one signal indication.	
B	Delay is not unreasonable, stable traffic flow.	On a rare occasion motorists wait through more than one signal indication.	
C	Stable condition, movements somewhat restricted due to higher volumes, but not objectionable for motorists.	Intermittently drivers wait through more than one signal indication, and occasionally backups may develop behind left turning vehicles, traffic flow still stable and acceptable.	
D	Movements more restricted, queues and delays may occur during short peaks, but lower demands occur often enough to permit clearing, thus preventing excessive backups.	Delays at intersections may become extensive with some, especially left-turning vehicles waiting two or more signal indications, but enough cycles with lower demand occur to permit periodic clearance, thus preventing excessive backups.	
E	Actual capacity of the roadway involves delay to all motorists due to congestion.	Very long queues may create lengthy delays, especially for left-turning vehicles.	
F	Forced flow with demand volumes greater than capacity resulting in complete congestion. Volumes drop to zero in extreme cases.	Backups from locations downstream restrict or prevent movement of vehicles out of approach creating a storage area during part or all of an hour.	

SOURCE: "A Policy on Design of Design of Urban Highways and Arterial Streets" - AASHTO, 1973 based upon material published in "Highway Capacity Manual", National Academy of Sciences, 1965.

For signalized and unsignalized intersections, level of service is defined in terms of **delay**, a measure of driver discomfort, frustration, fuel consumption and lost travel time. **Table 2-2** summarizes the delay associated with each LOS category:

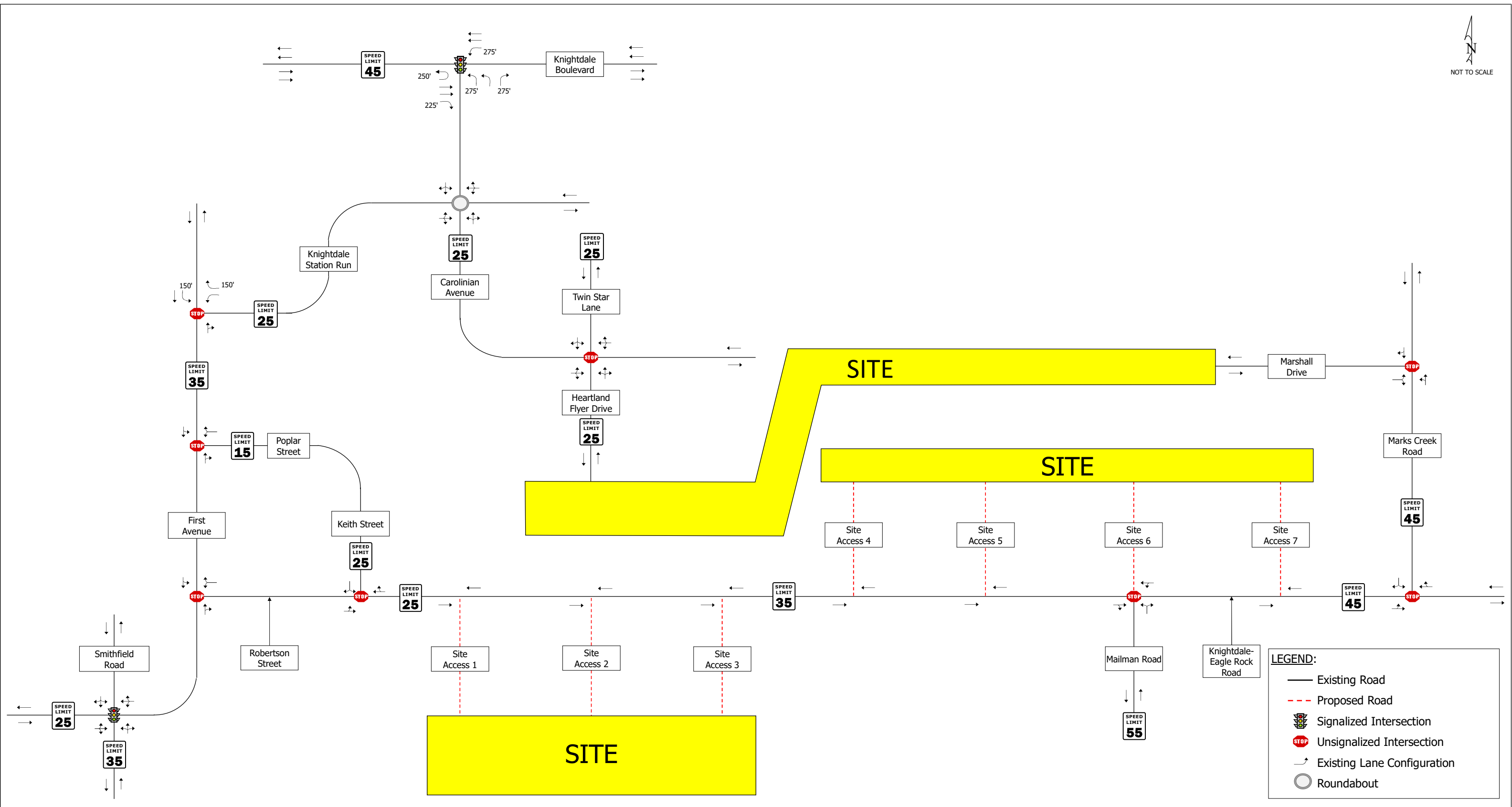
Table 2-2: Signalized and Unsignalized Intersection Level of Service Criteria

Signalized Intersections		Unsignalized Intersections	
Level of Service	Control Delay per Vehicle (sec/veh)	Level of Service	Average Control Delay (sec/veh)
A	≤ 10	A	0 to 10
B	> 10 to ≤ 20	B	> 10 to ≤ 15
C	> 20 to ≤ 35	C	> 15 to ≤ 25
D	> 35 to ≤ 55	D	> 25 to ≤ 35
E	> 55 to ≤ 80	E	> 35 to ≤ 50
F	> 80	F	> 50

Source: Exhibit 16-2 and Exhibit 17-2 from TRB's "Highway Capacity Manual 2000"

Capacity analyses were performed to assess operational conditions. Study area intersections were analyzed using SYNCHRO Version 10.3. Synchro is based on Highway Capacity Manual (HCM) methodologies with the following assumptions:

- Existing grades;
- 12-foot lane widths;
- No parking activity, bus stops, or pedestrians;
- Peak hour factor (PHF) of 0.90;
- Heavy vehicle percentages 2%;
- Minimum 4 vehicles per hour (VPH) for all allowed permissible movements; and
- Signal data found in the provided traffic signal plans (see **Appendix C**).



LEGEND:

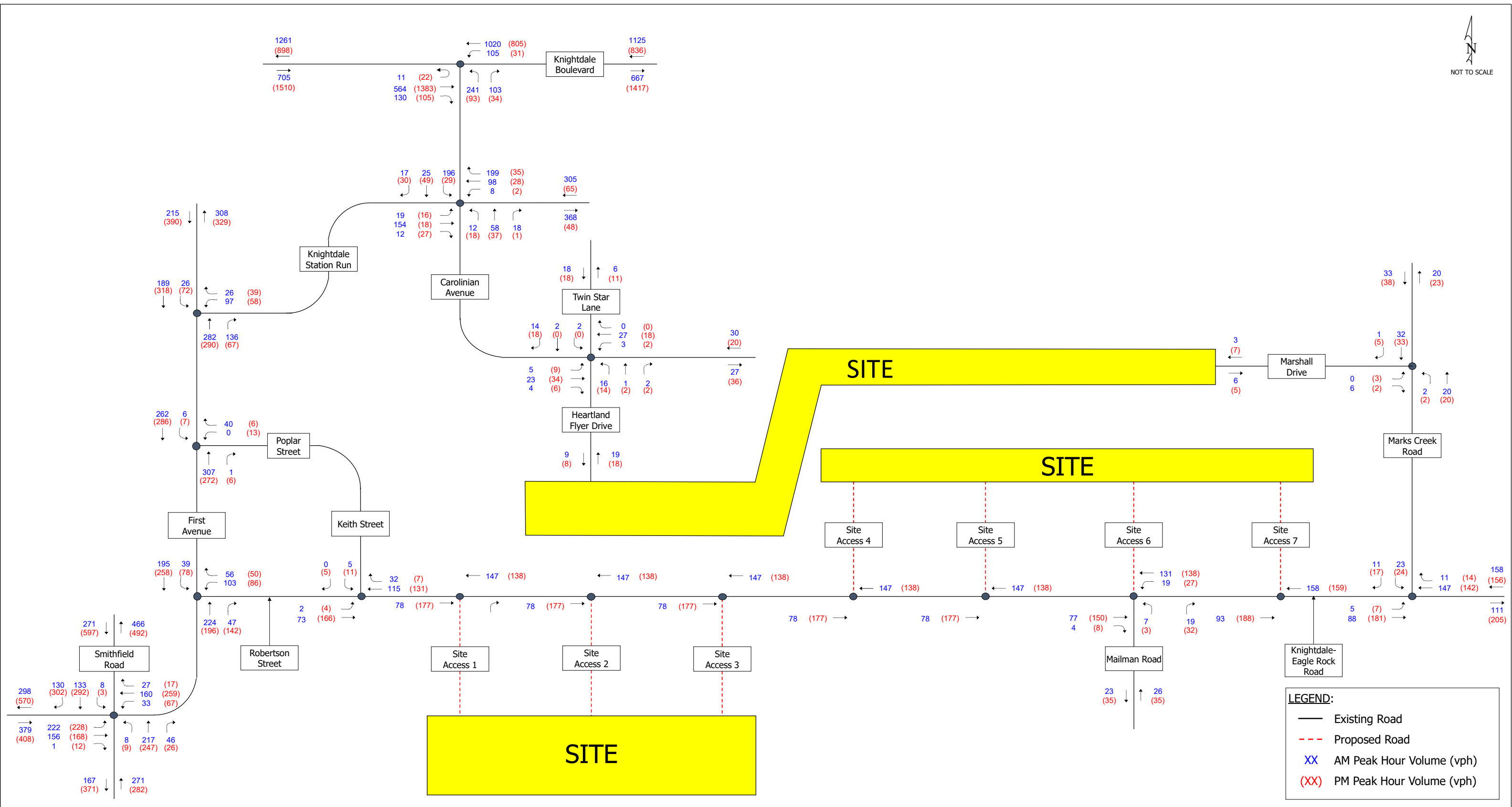
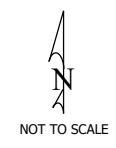
- Existing Road
- - - Proposed Road
- 🚦 Signalized Intersection
- STOP Unsignalized Intersection
- ↔ Existing Lane Configuration
- ⊙ Roundabout



Robertson Street Assemblage Traffic Impact Analysis

2022 Existing Lane Configuration

Figure 2-2



Robertson Street Assemblage Traffic Impact Analysis
2022 Existing Traffic Volumes

Figure 2-3

3 EXISTING AND BACKGROUND CONDITIONS AND ANALYSIS

3.1 2022 EXISTING ANALYSES

Table 3-1 summarizes the 2022 Existing intersection LOS, based on the geometry shown in **Figure 2-2** and the 2022 Existing traffic volumes shown in **Figure 2-3**. **Table 3-2** summarizes the 2022 Existing roundabout LOS, delay, and volume / capacity (V/C) ratios. The corresponding SYNCHRO and SIDRA output is included in **Appendix D**.

The signalized intersection of Carolinian Avenue and Knightdale Boulevard is currently operating at an overall LOS B during both 2022 Existing AM and PM peak hours. All intersection approaches are currently operating at a LOS C or better during both peak hours.

The Carolinian Avenue / Knightdale Station Run roundabout is currently operating at an overall A during both 2022 Existing AM and PM peak hours. All approaches are currently operating at a LOS A during both peak hours. All approaches are projected to have a maximum 0.278 V/C ratio during both peak hours. Per NCDOT guidelines, roundabouts are considered to operate unacceptably when the V/C ratio is greater than 0.85.

All First Avenue / Knightdale Station Run unsignalized intersection approaches are currently operating at a LOS C or better during the 2022 Existing AM and PM peak hours.

All Carolinian Avenue / Heartland Flyer Drive / Twin Star Lane unsignalized intersection approaches are currently operating at a LOS A during the 2022 Existing AM and PM peak hours.

All Marks Creek Road / Marshall Drive unsignalized intersection approaches are currently operating at a LOS A during the 2022 Existing AM and PM peak hours.

All First Avenue / Poplar Street unsignalized intersection approaches are currently operating at a LOS B or better during the 2022 Existing AM and PM peak hours.

All Robertson Street / N First Avenue unsignalized intersection approaches are currently operating at a LOS C or better during the 2022 Existing AM and PM peak hours.

All Robertson Street / Keith Street unsignalized intersection approaches are currently operating at a LOS B or better during the 2022 Existing AM and PM peak hours.

All Robertson Street / Knightdale Eagle Rock Road / Mailman Road unsignalized intersection approaches are currently operating at a LOS A during the 2022 Existing AM and PM peak hours.

All Knightdale Eagle Road / Marks Creek Road unsignalized intersection are currently operating at a LOS B or better during the 2022 Existing AM and PM peak hours.

The signalized intersection of Smithfield Road and First Avenue is currently operating at an overall LOS B and LOS D during the 2022 Existing AM and PM peak hours, respectively. All intersection approaches are currently operating at a LOS D or better during both peak hours.

**Table 3-1: Intersection Level of Service and Delay Summary
2022 Existing Traffic Volumes**

Intersection	Movement and Approach	AM PEAK HOUR		PM PEAK HOUR	
		Delay ¹ (sec/veh)	LOS ¹	Delay ¹ (sec/veh)	LOS ¹
1: Carolinian Ave & Knightdale Blvd	EB Approach	12.5	B	12.0	B
	WB Approach	7.5	A	4.0	A
	NB Approach	17.0	B	27.5	C
	Overall	10.6	B	10.1	B
3: First Ave & Knightdale Station Run	WB Approach	15.3	C	16.4	C
	NB Approach	0.0	A	0.0	A
	SB Approach	1.0	A	1.5	A
4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave	EB Approach	1.1	A	1.3	A
	WB Approach	0.8	A	1.1	A
	NB Approach	9.2	A	9.3	A
	SB Approach	8.8	A	8.8	A
5: Marks Creek Rd & Marshall Dr	EB Approach	8.7	A	8.7	A
	NB Approach	1.2	A	1.2	A
	SB Approach	0.0	A	0.0	A
6 First Ave & Poplar St	WB Approach	10.9	B	12.5	B
	NB Approach	0.0	A	0.0	A
	SB Approach	0.2	A	0.2	A
7: First Ave & Robertson St	WB Approach	15.0	C	18.0	C
	NB Approach	0.0	A	0.0	A
	SB Approach	1.3	A	1.9	A
8: Robertson St & Keith St	EB Approach	0.4	A	0.2	A
	WB Approach	0.0	A	0.0	A
	SB Approach	9.5	A	10.2	B
14: Mailman Rd & Robertson St/Knightdale Eagle Rock Rd	EB Approach	0.0	A	0.0	A
	WB Approach	0.9	A	1.2	A
	NB Approach	9.2	A	9.6	A
16: Knightdale Eagle Rock Rd & Marks Creek Rd	EB Approach	0.4	A	0.3	A
	WB Approach	0.0	A	0.0	A
	SB Approach	10.0	B	10.5	B
17: Smithfield Rd & First Ave	EB Approach	17.7	B	50.7	D
	WB Approach	9.1	A	19.2	B
	NB Approach	18.5	B	17.7	B
	SB Approach	20.4	C	46.6	D
	Overall	16.8	B	36.9	D

¹ Overall intersection LOS and delay not reported for TWSC intersections.

* - 95th percentile queues for unsignalized intersections reported in number of vehicles.

**Table 3-2: Intersection Level of Service, Delay, and V/C Ratio Summary
2022 Existing Traffic Volumes**

Intersection and Type of Control	Movement and Approach	AM PEAK HOUR			PM PEAK HOUR		
		Delay ¹ (sec/veh)	LOS ¹	V/C	Delay ¹ (sec/veh)	LOS ¹	V/C
2: Carolinian Avenue / Knightdale Station Run	EB Approach	5.3	A	0.198	3.4	A	0.055
	WB Approach	5.5	A	0.278	3.4	A	0.060
	NB Approach	5.1	A	0.111	3.3	A	0.052
	SB Approach	5.0	A	0.224	3.6	A	0.094
	Overall	5.3	A	0.278	3.4	A	0.094

¹ Overall intersection LOS and delay reported for signalized intersections and roundabouts only.

3.2 2028 AND 2038 BACKGROUND TRAFFIC VOLUMES

Figure 3-1 and **Figure 3-2** show the 2028 and 2038 ambient traffic volumes, respectively. Ambient volumes were calculated using a 3% growth rate for six and 1% growth rate for the subsequent 10 years.

Per the scoping information (see **Appendix A**), there are two (2) approved development in the project study area that will be fully constructed by 2028: Smithfield Mixed Use Development and the Collection Development (see **Appendix E**).

Listed below are the approved developments, site trip distribution assumptions, and proposed offsite improvements.

- Smithfield Mixed Use Development
 - TIA completed by Ramey Kemp Associates – Sealed 11/23/20
 - Located along Smithfield Road and Mailman Road
 - 97 single-family detached housing, 416 multifamily housing (apartments), and 16,600 square-foot retail space
 - Trip distribution assumed to follow patterns in existing TIA and Engineering judgement
- The Collection Development
 - No TIA completed
 - Traffic memorandum completed by VHB (09/03/2019)
 - Located east of Keith Street and north of Robertson Street
 - 57 single-family detached housing, 32 multifamily Housing (townhomes)
 - Trip distribution based on existing traffic patterns and Engineering judgement

Projected and distributed trips from the approved and proposed area developments (see **Appendix E**) are located in **Figure 3-3**. Approved development trips were added to the 2028 ambient volumes (**Figure 3-1**) to determine the 2028 Background traffic volumes (see **Figure 3-4**). Approved development trips were added to the 2038 ambient volumes (**Figure 3-2**) to determine the 2038 Background traffic volumes (see **Figure 3-5**).

3.3 2028 BACKGROUND ANALYSIS

Table 3-3 summarizes the 2028 Background intersection LOS and delay based on the geometry shown in **Figure 2-2** and the 2028 Background traffic volumes shown in **Figure 3-4**. **Table 3-4** summarizes the 2028 Background roundabout LOS, delay, and V/C ratios. The corresponding SYNCHRO and SIDRA output is included in **Appendix D**.

The signalized intersection of Carolinian Avenue and Knightdale Boulevard is projected to operate at an overall LOS B during both 2028 Background AM and PM peak hours. All intersection approaches are projected to operate at a LOS C or better during both peak hours.

The Carolinian Avenue / Knightdale Station Run roundabout is projected to operate at an overall A during both 2028 Background AM and PM peak hours. All approaches are projected to operate at a LOS A during both peak hours. All approaches are projected to have a maximum 0.339 V/C ratio during both peak hours.

All First Avenue / Knightdale Station Run unsignalized intersection approaches are projected to operate at a LOS C or better during the 2028 Background AM and PM peak hours.

All Carolinian Avenue / Heartland Flyer Drive / Twin Star Lane unsignalized intersection approaches are projected to operate at a LOS A during the 2028 Background AM and PM peak hours.

All Marks Creek Road / Marshall Drive unsignalized intersection approaches are projected to operate at a LOS A during the 2028 Background AM and PM peak hours.

All First Avenue / Poplar Street unsignalized intersection approaches are projected to operate at a LOS B or better during the 2028 Background AM and PM peak hours.

All Robertson Street / N First Avenue unsignalized intersection approaches are projected to operate at a LOS D or better during the 2028 Background AM and PM peak hours.

All Robertson Street / Keith Street unsignalized intersection approaches are projected to operate at a LOS B or better during the 2028 Background AM and PM peak hours.

All Robertson Street / Knightdale Eagle Rock Road / Mailman Road unsignalized intersection approaches are projected to operate at a LOS B or better during the 2028 Background AM and PM peak hours.

All Knightdale Eagle Road / Marks Creek Road unsignalized intersection are projected to operate at a LOS B or better during the 2028 Background AM and PM peak hours.

The signalized intersection of Smithfield Road and First Avenue is projected to operate at an overall LOS C and LOS F during the 2028 Background AM and PM peak hours, respectively. The east and southbound approaches are projected to operate at LOS F during the 2028 PM peak hour. All other intersection approaches are projected to operate at a LOS C or better during both peak hours.

**Table 3-3: Intersection Level of Service and Delay Summary
2028 Background Traffic Volumes**

Intersection	Movement and Approach	AM PEAK HOUR		PM PEAK HOUR	
		Delay ¹ (sec/veh)	LOS ¹	Delay ¹ (sec/veh)	LOS ¹
1: Carolinian Ave & Knightdale Blvd	EB Approach	13.8	B	17.1	B
	WB Approach	8.4	A	4.1	A
	NB Approach	20.5	C	30.2	C
	Overall	12.0	B	13.4	B
3: First Ave & Knightdale Station Run	WB Approach	20.4	C	22.7	C
	NB Approach	0.0	A	0.0	A
	SB Approach	1.0	A	1.5	A
4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave	EB Approach	1.2	A	1.4	A
	WB Approach	0.7	A	1.0	A
	NB Approach	9.3	A	9.4	A
	SB Approach	8.9	A	8.8	A
5: Marks Creek Rd & Marshall Dr	EB Approach	8.7	A	8.8	A
	NB Approach	0.9	A	0.9	A
	SB Approach	0.0	A	0.0	A
6: First Ave & Poplar St	WB Approach	11.9	B	14.1	B
	NB Approach	0.0	A	0.0	A
	SB Approach	0.3	A	0.5	A
7: First Ave & Robertson St	WB Approach	21.4	C	30.4	D
	NB Approach	0.0	A	0.0	A
	SB Approach	1.5	A	2.2	A
8: Robertson St & Keith St	EB Approach	0.4	A	0.5	A
	WB Approach	0.0	A	0.0	A
	SB Approach	10.3	B	11.3	B
14: Mailman Rd & Robertson St/Knightdale Eagle Rock Rd	EB Approach	0.0	A	0.0	A
	WB Approach	0.9	A	1.2	A
	NB Approach	10.2	B	10.6	B
16: Knightdale Eagle Rock Rd & Marks Creek Rd	EB Approach	0.7	A	0.4	A
	WB Approach	0.0	A	0.0	A
	SB Approach	10.6	B	11.2	B
17: Smithfield Rd & First Ave	EB Approach	27.0	C	130.0	F
	WB Approach	10.4	B	32.3	C
	NB Approach	28.8	C	30.7	C
	SB Approach	30.1	C	123.7	F
	Overall	25.1	C	89.6	F

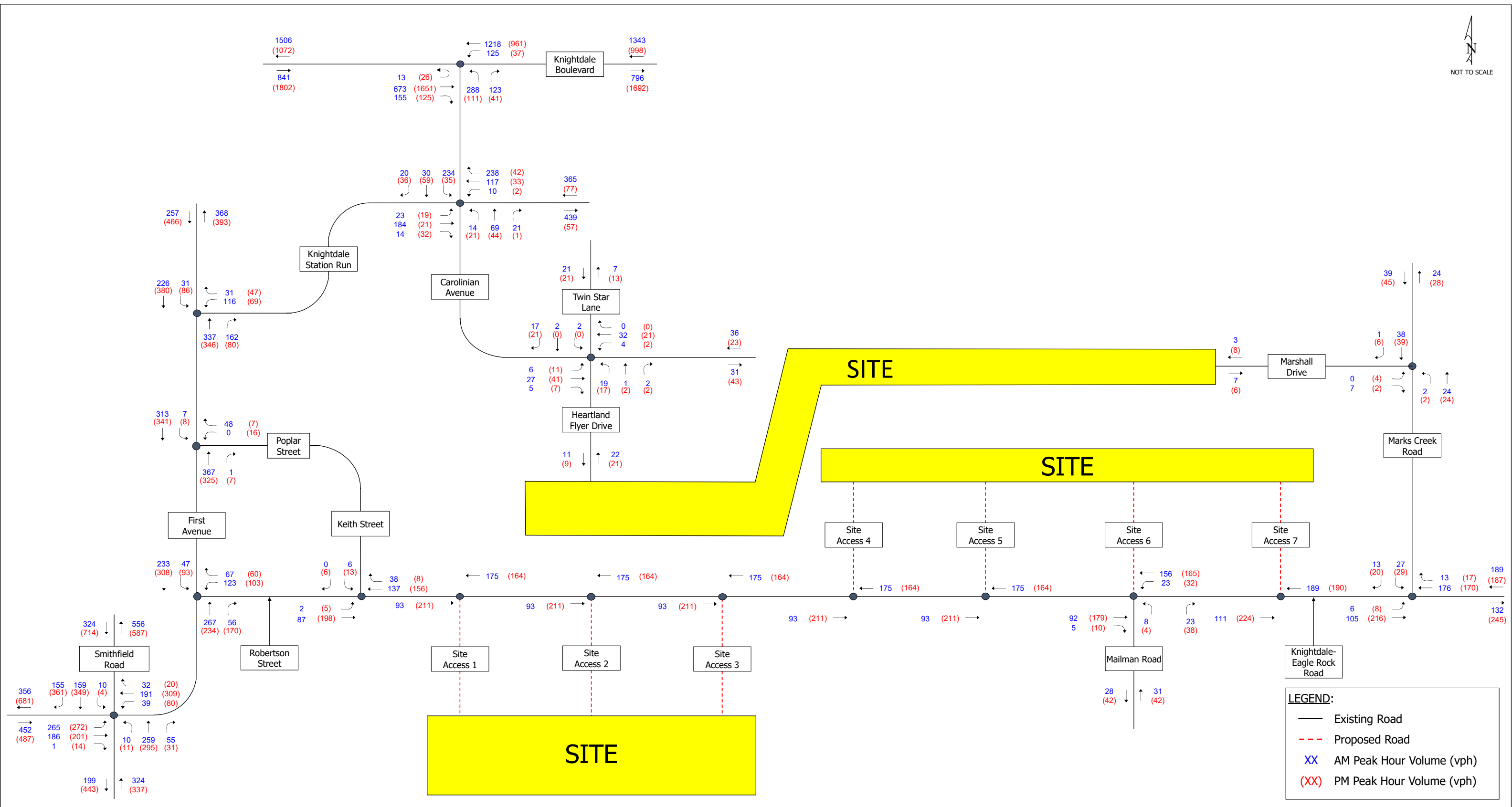
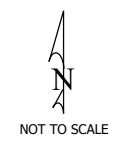
¹ Overall intersection LOS and delay not reported for TWSC intersections.

* - 95th percentile queues for unsignalized intersections reported in number of vehicles.

**Table 3-4: Intersection Level of Service, Delay, and V/C Ratio Summary
2028 Background Traffic Volumes**

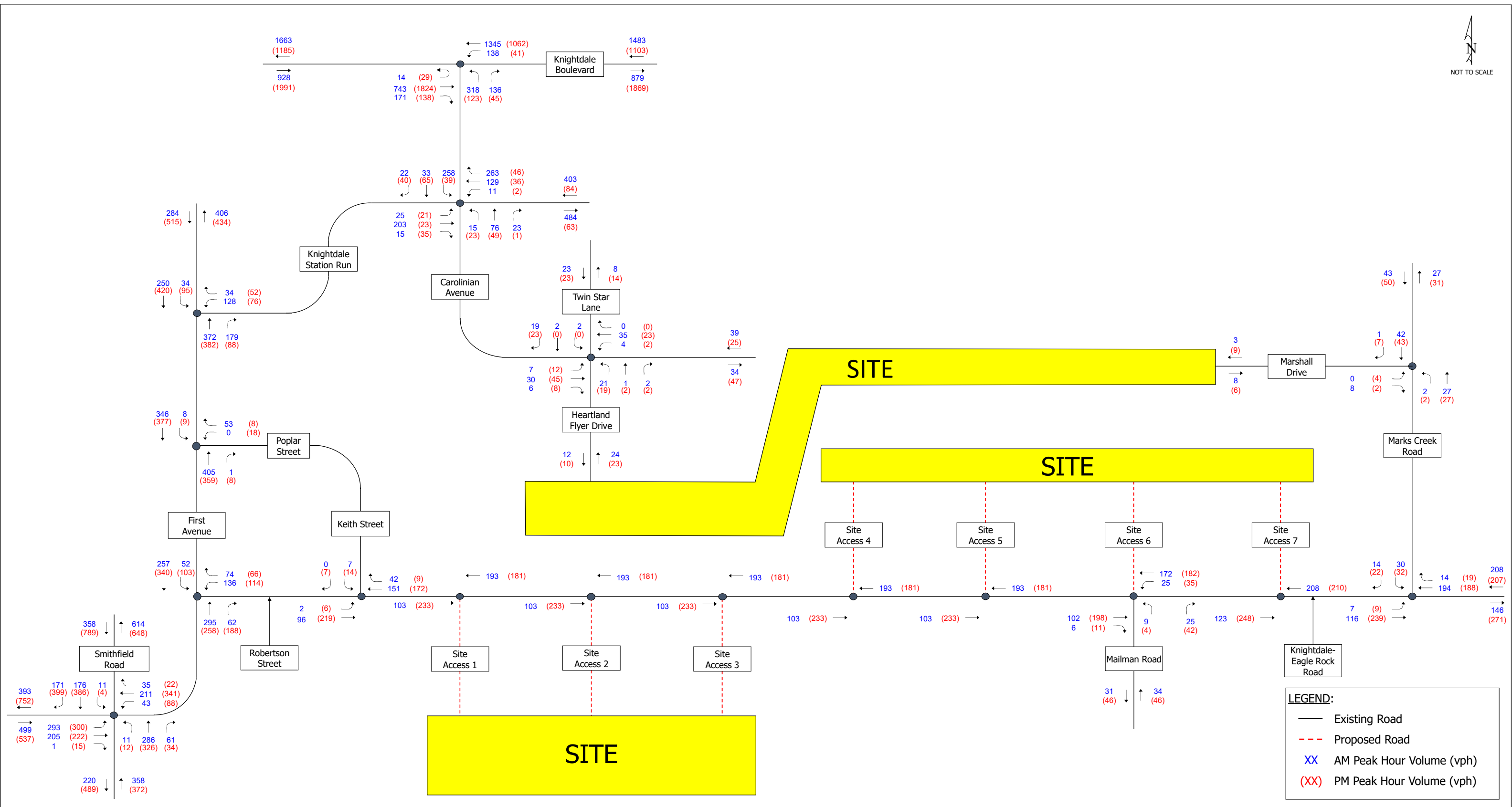
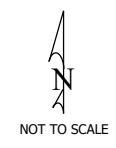
Intersection and Type of Control	Movement and Approach	AM PEAK HOUR			PM PEAK HOUR		
		Delay ¹ (sec/veh)	LOS ¹	V/C	Delay ¹ (sec/veh)	LOS ¹	V/C
2: Carolinian Avenue / Knightdale Station Run	EB Approach	6.1	A	0.249	3.5	A	0.066
	WB Approach	6.2	A	0.339	3.5	A	0.071
	NB Approach	5.9	A	0.142	3.4	A	0.062
	SB Approach	5.7	A	0.275	3.8	A	0.114
	Overall	6.0	A	0.339	3.6	A	0.114

¹ Overall intersection LOS and delay reported for signalized intersections and roundabouts only.



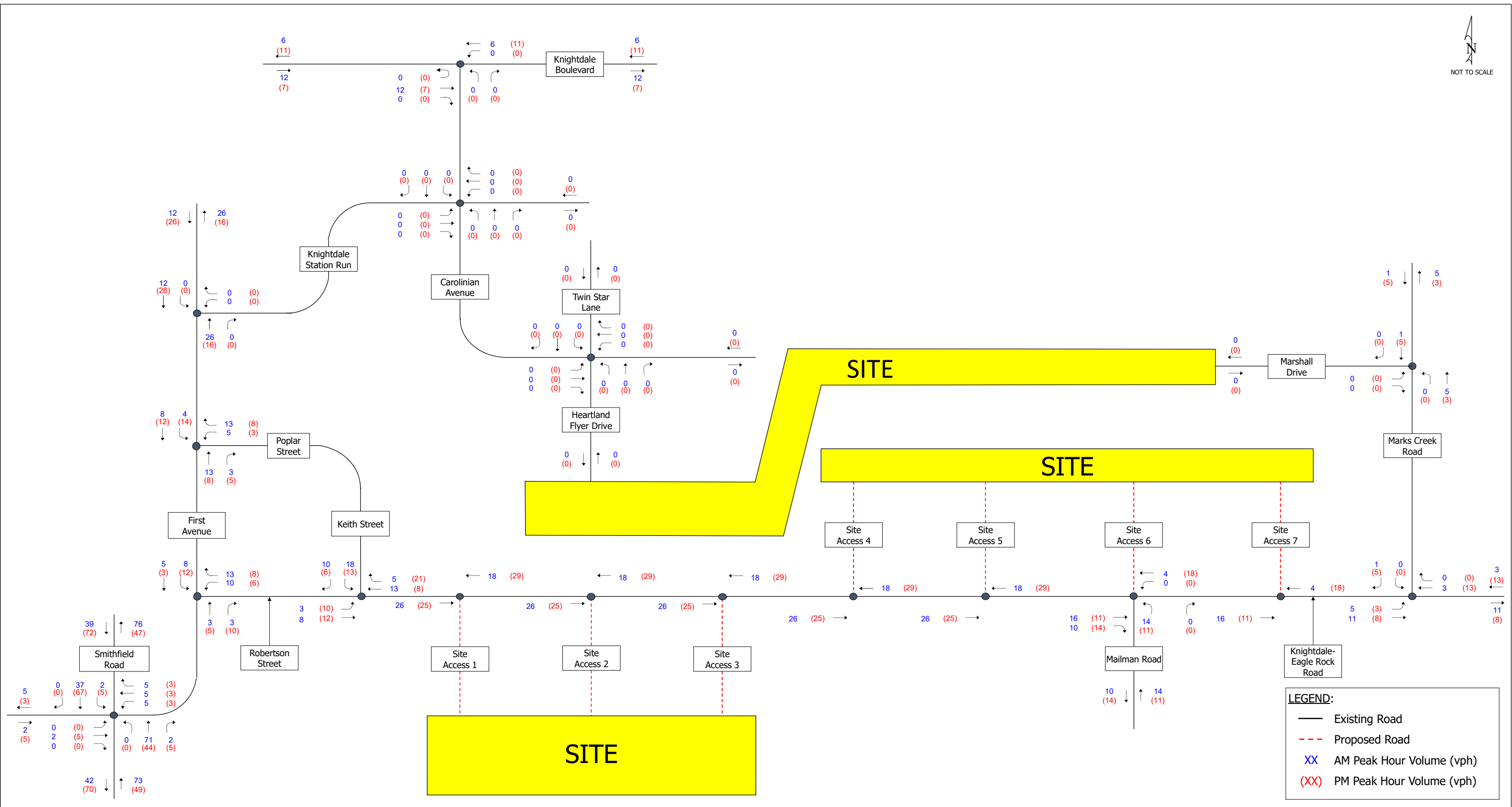
Robertson Street Assemblage Traffic Impact Analysis
 2028 Ambient Traffic Volumes

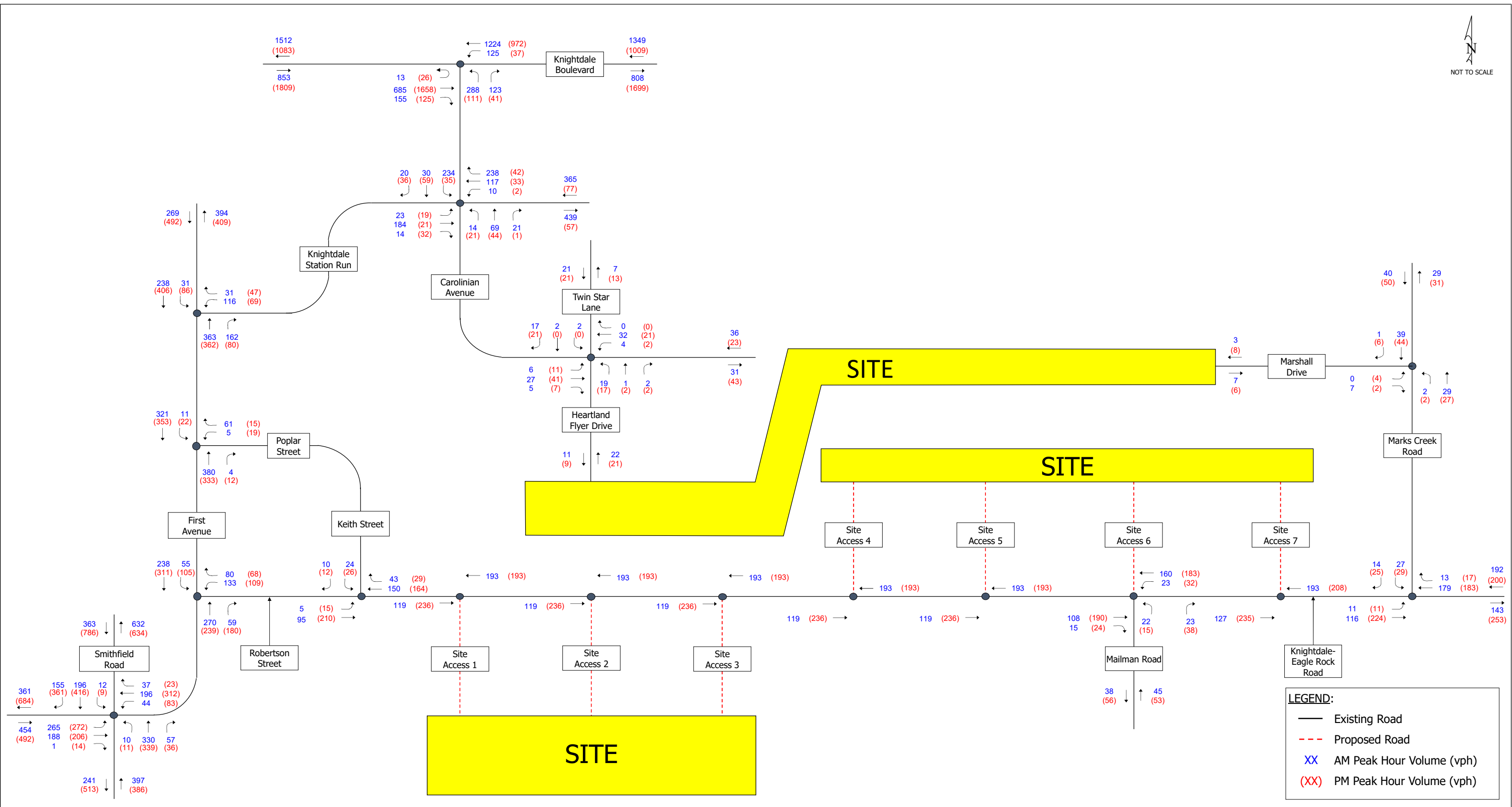
Figure 3-1



Robertson Street Assemblage Traffic Impact Analysis
 2038 Ambient Traffic Volumes

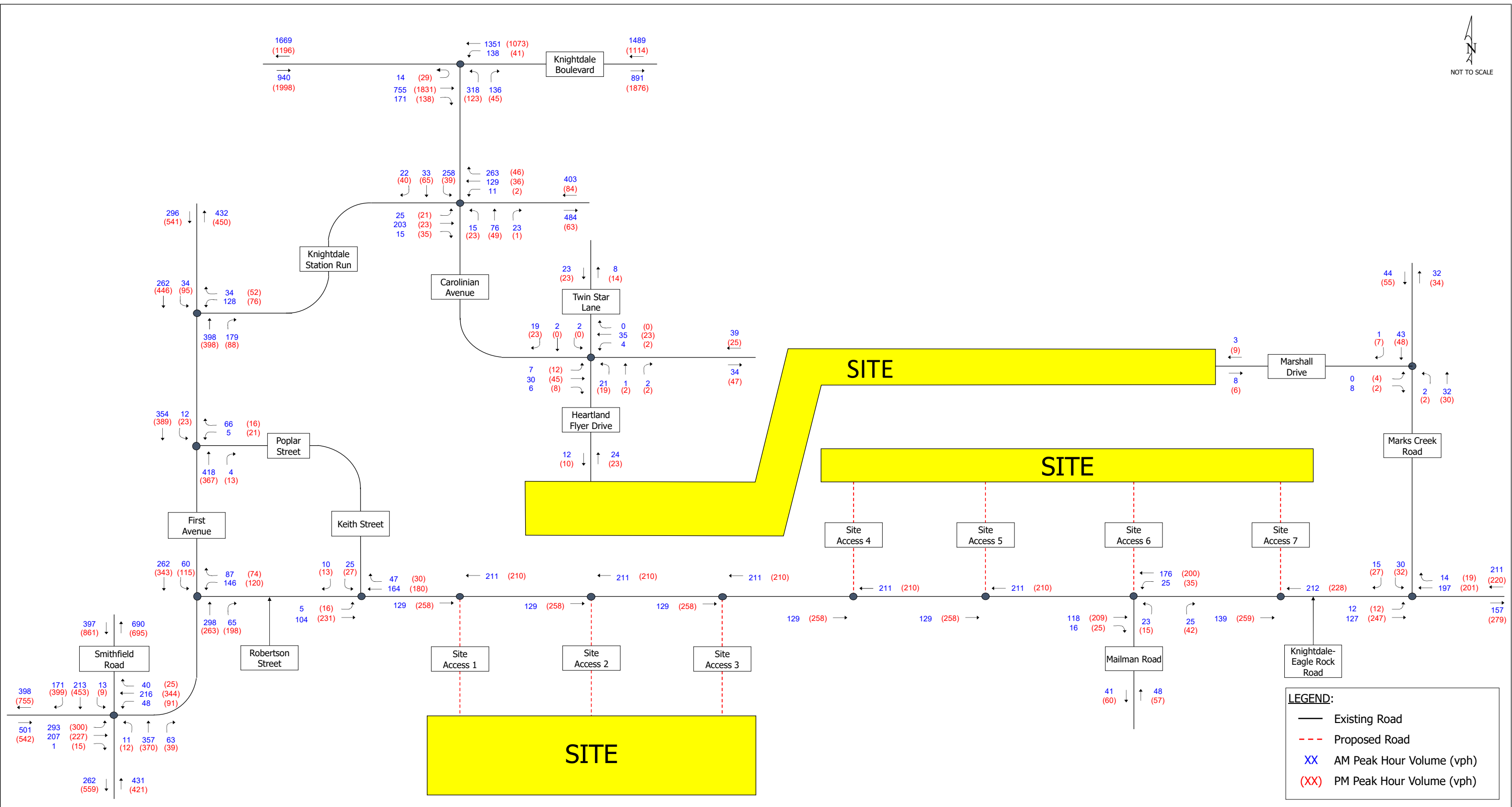
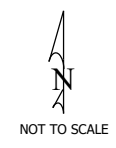
Figure 3-2





Robertson Street Assemblage Traffic Impact Analysis
2028 Background Traffic Volumes

Figure 3-4



Robertson Street Assemblage Traffic Impact Analysis
 2038 Background Traffic Volumes

Figure 3-5

4 SITE TRIP GENERATION AND DISTRIBUTION

Robertson Street Assemblage Development site trips were estimated based on the proposed land uses supplied by the developer and subsequently distributed onto the surrounding roadway network.

4.1 TRIP GENERATION

The site-generated trips shown in **Table 4-1** are based on trip generation information provided in the 10th Edition of the Institute of Transportation Engineer's (ITE's) *Trip Generation Manual* and the projected mixed-use development land uses. The trip generation was calculated using the proposed number of residential units and building square-footages as the independent variables. The provided equations and/or rates were used to generate trips (per NCDOT standards and procedures).

Table 4-1: Trip Generation Summary

ITE Land Use Code	Independent Variable	AM Peak Hour			PM Peak Hour			Daily Traffic
		In	Out	Total	In	Out	Total	
210 – Single Family Detached Housing	491 DU	88	265	353	295	173	468	4,495
220 – Multifamily Housing (Low Rise)	176 DU	19	63	82	62	36	98	1,290
565 – Day Care Center	3,000 SF	17	16	33	16	17	33	143
720 – Medical-Dental Office Building	5,000 SF	11	3	14	5	12	17	174
710 – General Office Building	7,000 SF	14	2	16	13	60	73	80
932 – High-Turnover (Sit-down) Restaurant	2,000 SF	16	12	28	18	17	35	224
932 – High-Turnover (Sit-down) Restaurant	3,000 SF	24	18	42	27	25	52	337
Subtotal:		189	379	568	436	340	776	6,743
LUC 932 (2,000 SF) Pass-By (43% PM)		--	--	--	8	7	15	--
LUC 932 (3,000 SF) Pass-By (43% PM)		--	--	--	12	11	23	--
Total Development:		189	379	568	416	322	738	6,743

SOURCE: Institute of Transportation Engineers' *Trip Generation Manual* 10th Edition (2017)

Prior to pass-by reductions, AM peak hour trips generated totaled 189 incoming and 379 outgoing where PM peak hour trips totaled 436 incoming and 340 outgoing. Following pass-by reductions, AM peak hour trips generated totaled 189 incoming and 379 outgoing where PM peak hour trips totaled 416 incoming and 322 outgoing. Average daily traffic (ADT) volumes generated by the development totaled 6,743 vehicles per day. No reduction in trips was included due to internal capture.

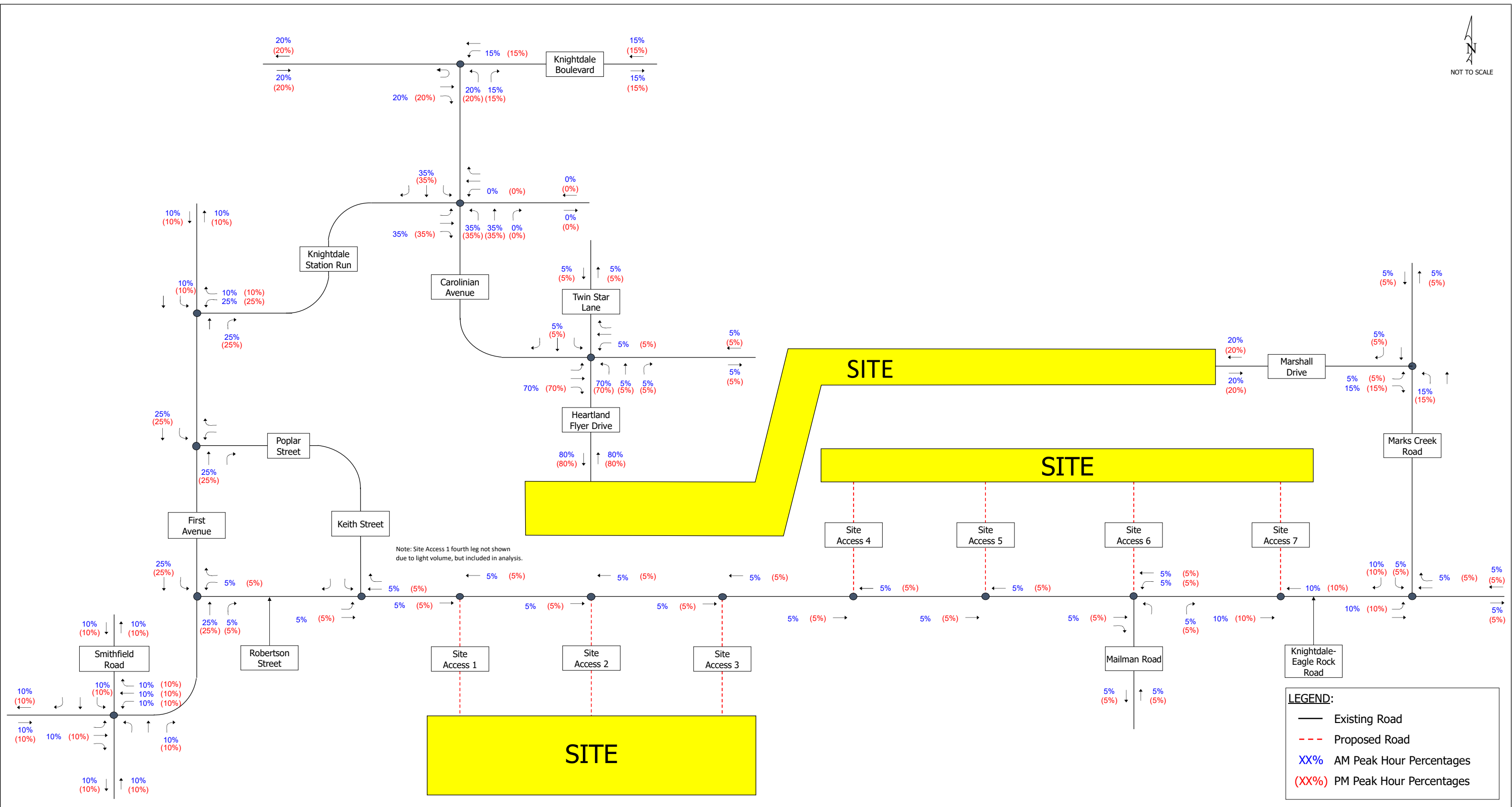
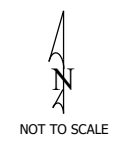
4.2 TRIP DISTRIBUTION

The directional traffic patterns, or trip distribution, of the site-generated traffic was determined using the existing AM and PM peak hour traffic characteristics and Engineering judgement. Total trips into and out of the study area using Knightdale Boulevard, Carolinian Avenue, Twin Star Lane, First Avenue, Marks Creek Road, Mailman Road, Knightdale Eagle Rock Road, and Smithfield Road form the basis for the

percentage distribution for the northern section. Total trips into and out of the study area using Knightdale Boulevard, First Avenue, Marks Creek Road, Mailman Road, Knightdale Eagle Rock Road, and Smithfield Road form the basis for the percentage distribution for the southern section. The percentages were routed, via shortest path, to and from the proposed development. The distribution percentages were then applied to the generated trips to predict routes and project traffic volumes for the 2028 Build scenario.

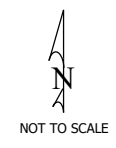
Residential development trip distribution percentages are shown in **Figures 4-1, 4-2, and 4-3**. Commercial development trip distribution percentages are shown in **Figures 4-4 and 4-5**. Commercial development pass-by percentages are shown in **Figure 4-6**.

Residential development trip distribution volumes are shown in **Figures 4-7, 4-8, and 4-9**. Commercial development trip distribution volumes are shown in **Figures 4-10 and 4-11**. Commercial development pass-by percentages are shown in **Figure 4-12**. Total trip distribution volumes are shown in **Figure 4-13**.

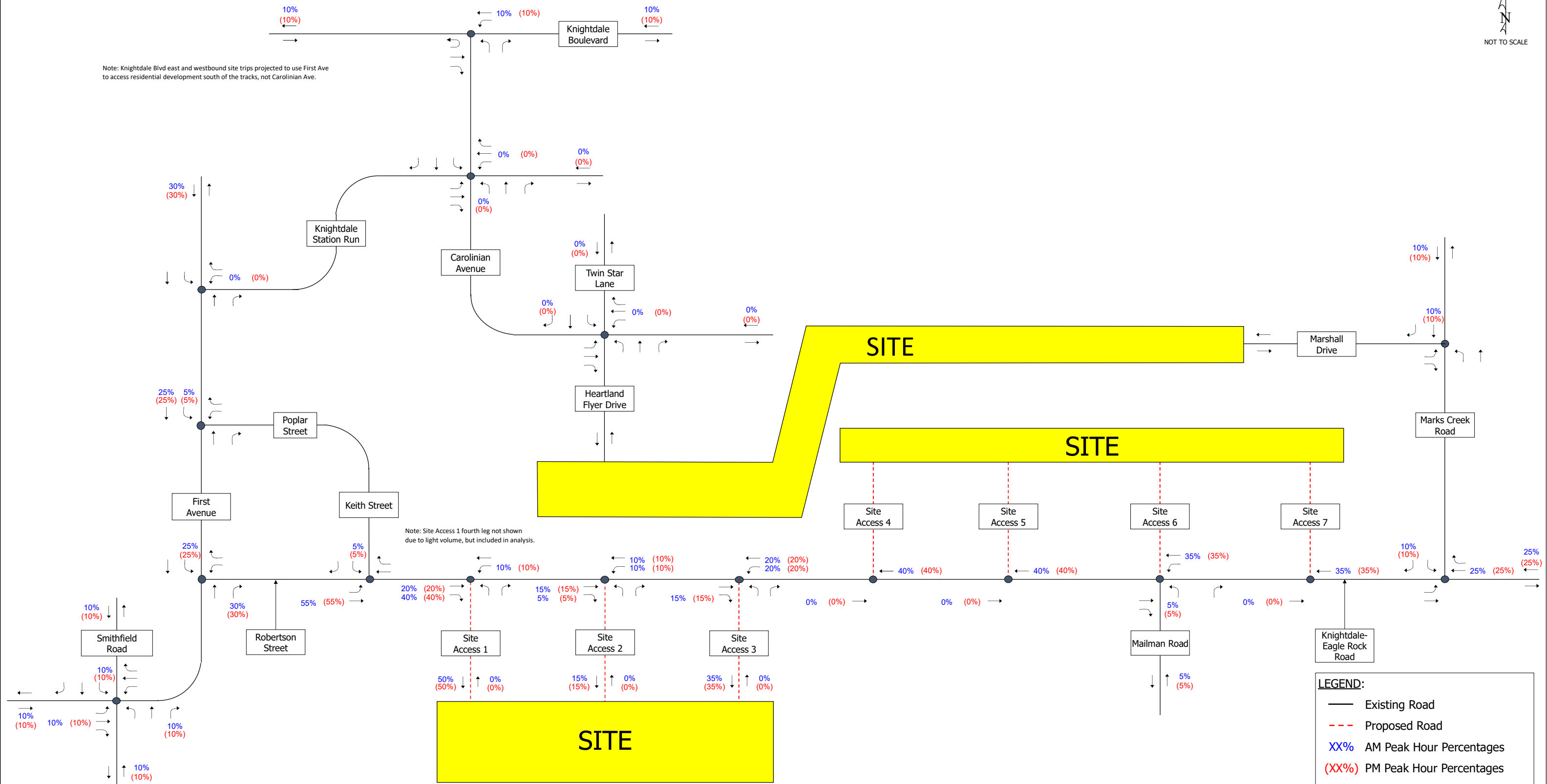


Robertson Street Assemblage Traffic Impact Analysis
 Trip Distribution Percentages (Residential - North of Railroad Tracks)

Figure 4-1



Note: Knightdale Blvd east and westbound site trips projected to use First Ave to access residential development south of the tracks, not Carolinian Ave.



Note: Site Access 1 fourth leg not shown due to light volume, but included in analysis.

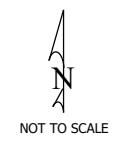
LEGEND:

- Existing Road
- - - Proposed Road
- XX% AM Peak Hour Percentages
- (XX%) PM Peak Hour Percentages



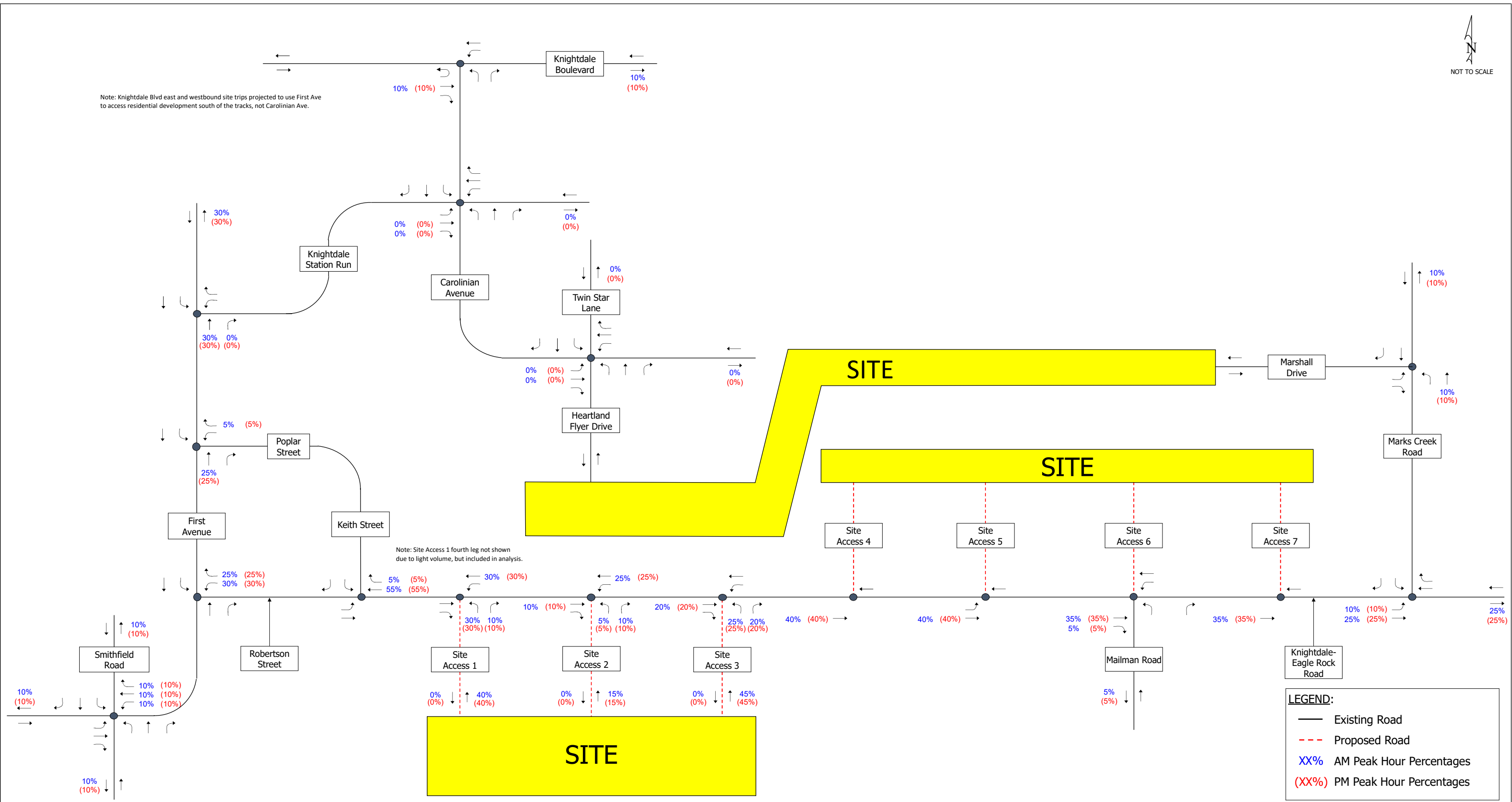
Robertson Street Assemblage Traffic Impact Analysis
 Trip Distribution Percentages (Residential - Ingress - South of Railroad Tracks)

Figure 4-2



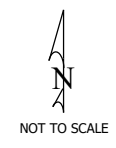
Note: Knightdale Blvd east and westbound site trips projected to use First Ave to access residential development south of the tracks, not Carolinian Ave.

Note: Site Access 1 fourth leg not shown due to light volume, but included in analysis.

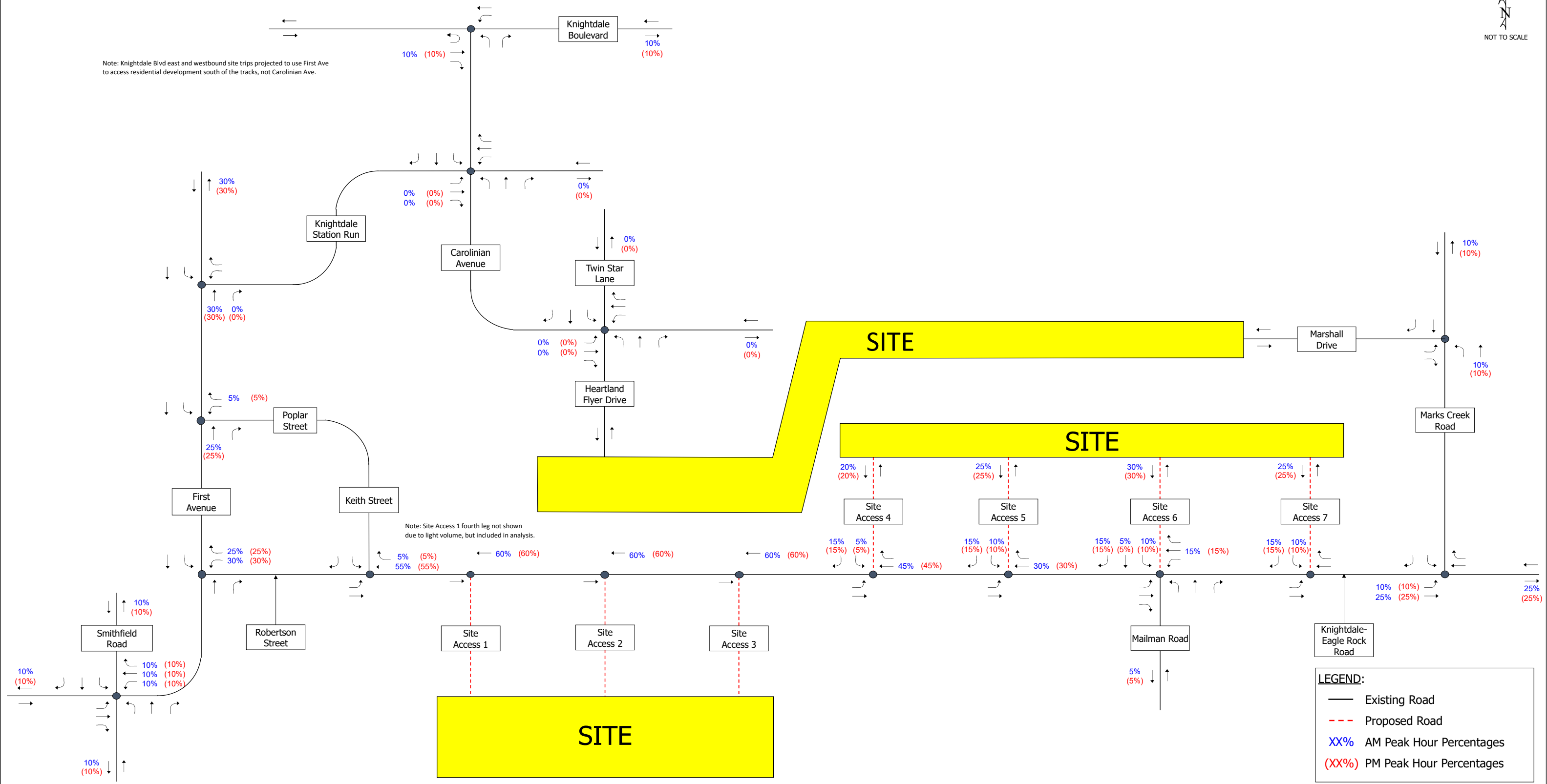


Robertson Street Assemblage Traffic Impact Analysis
Trip Distribution Percentages (Residential - Egress - South of Railroad Tracks)

Figure 4-3



Note: Knightdale Blvd east and westbound site trips projected to use First Ave to access residential development south of the tracks, not Carolinian Ave.



Note: Site Access 1 fourth leg not shown due to light volume, but included in analysis.

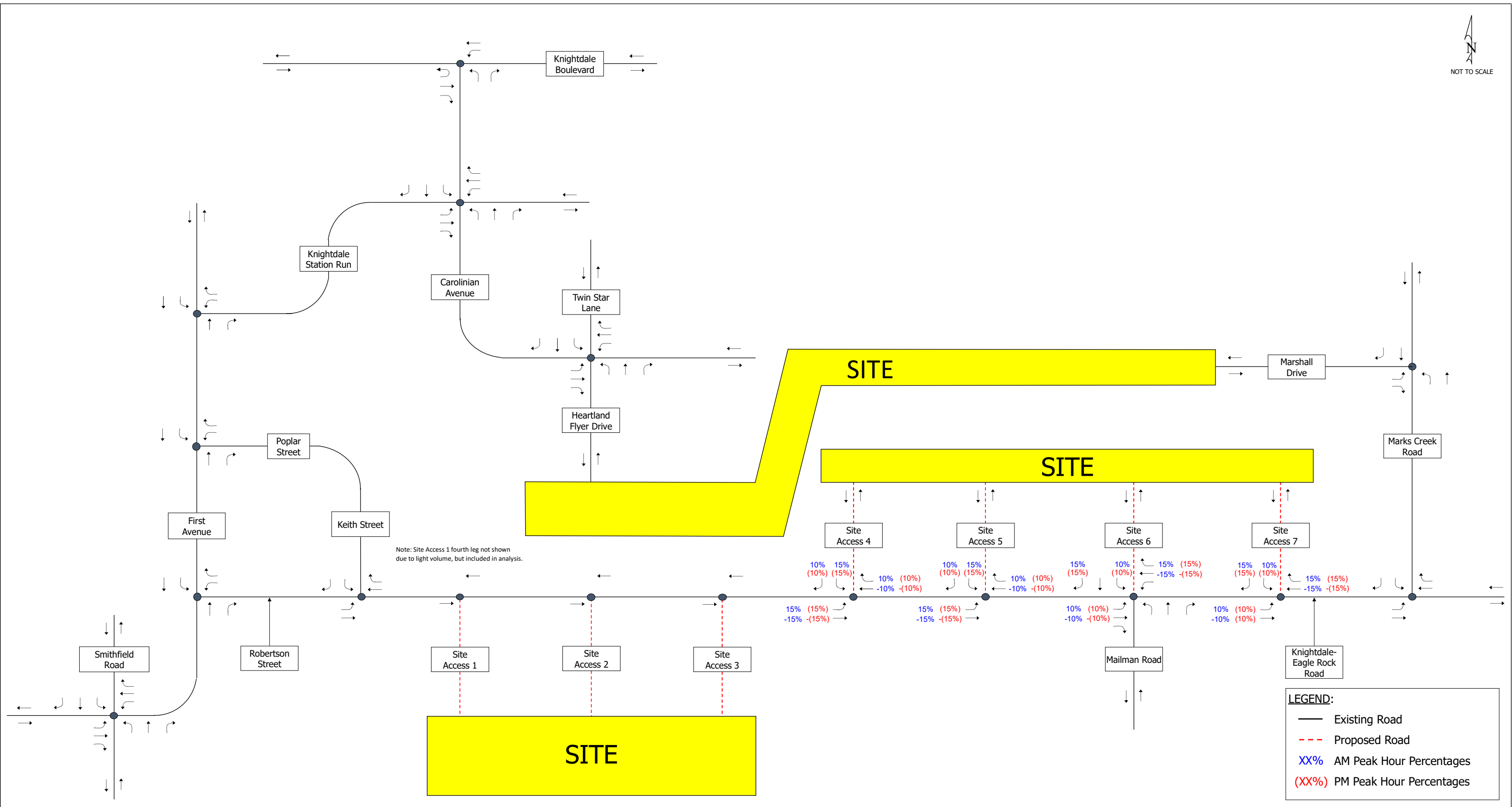
LEGEND:

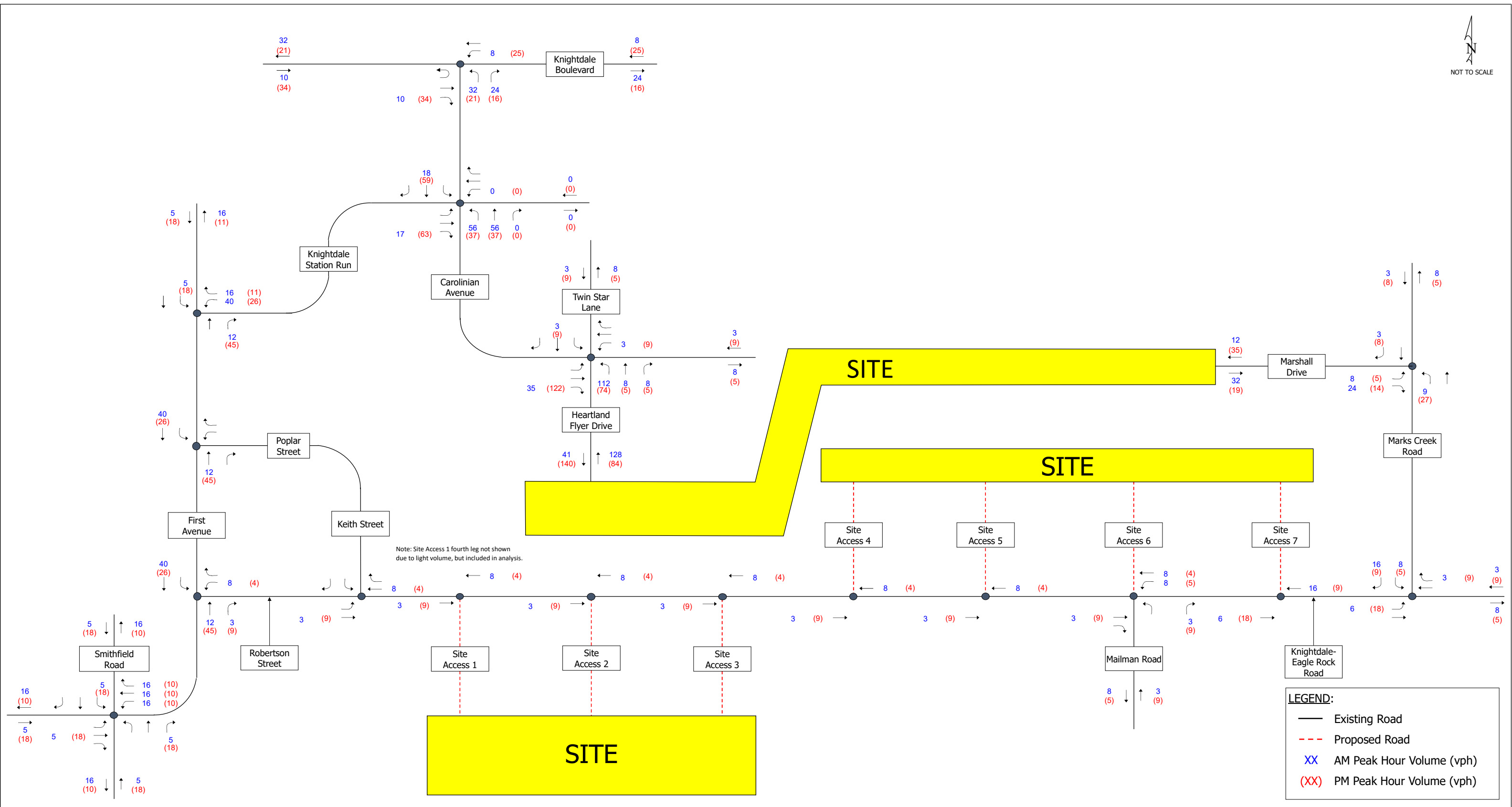
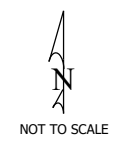
- Existing Road
- - - Proposed Road
- XX% AM Peak Hour Percentages
- (XX%) PM Peak Hour Percentages



Robertson Street Assemblage Traffic Impact Analysis
 Trip Distribution Percentages (Commercial - Egress)

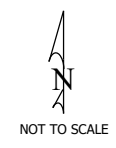
Figure 4-5



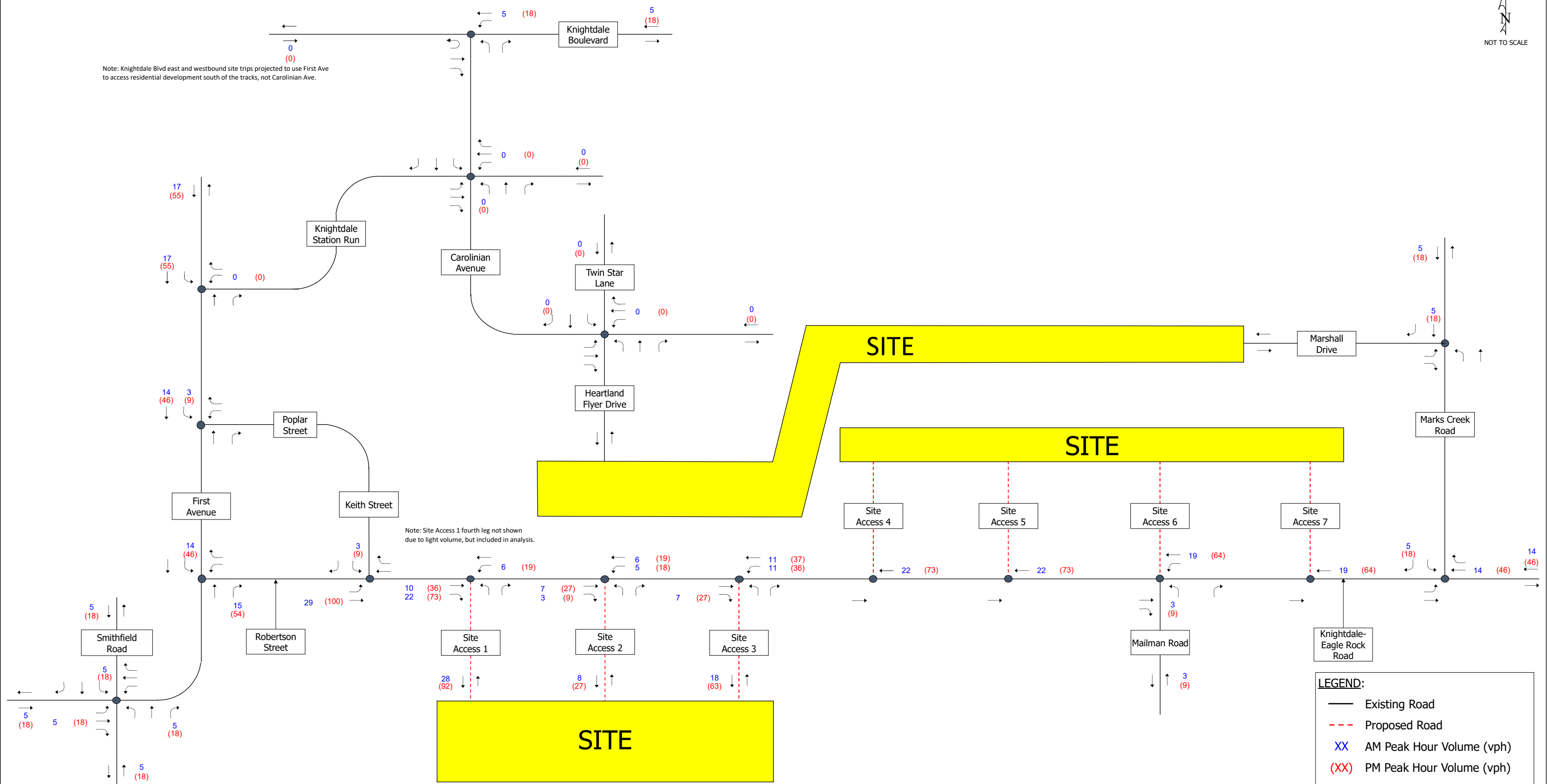


Robertson Street Assemblage Traffic Impact Analysis
 Trip Distribution Volumes (Residential - North of Railroad Tracks)

Figure 4-7



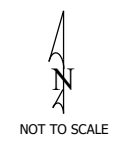
Note: Knightdale Blvd east and westbound site trips projected to use First Ave to access residential development south of the tracks, not Carolinian Ave.



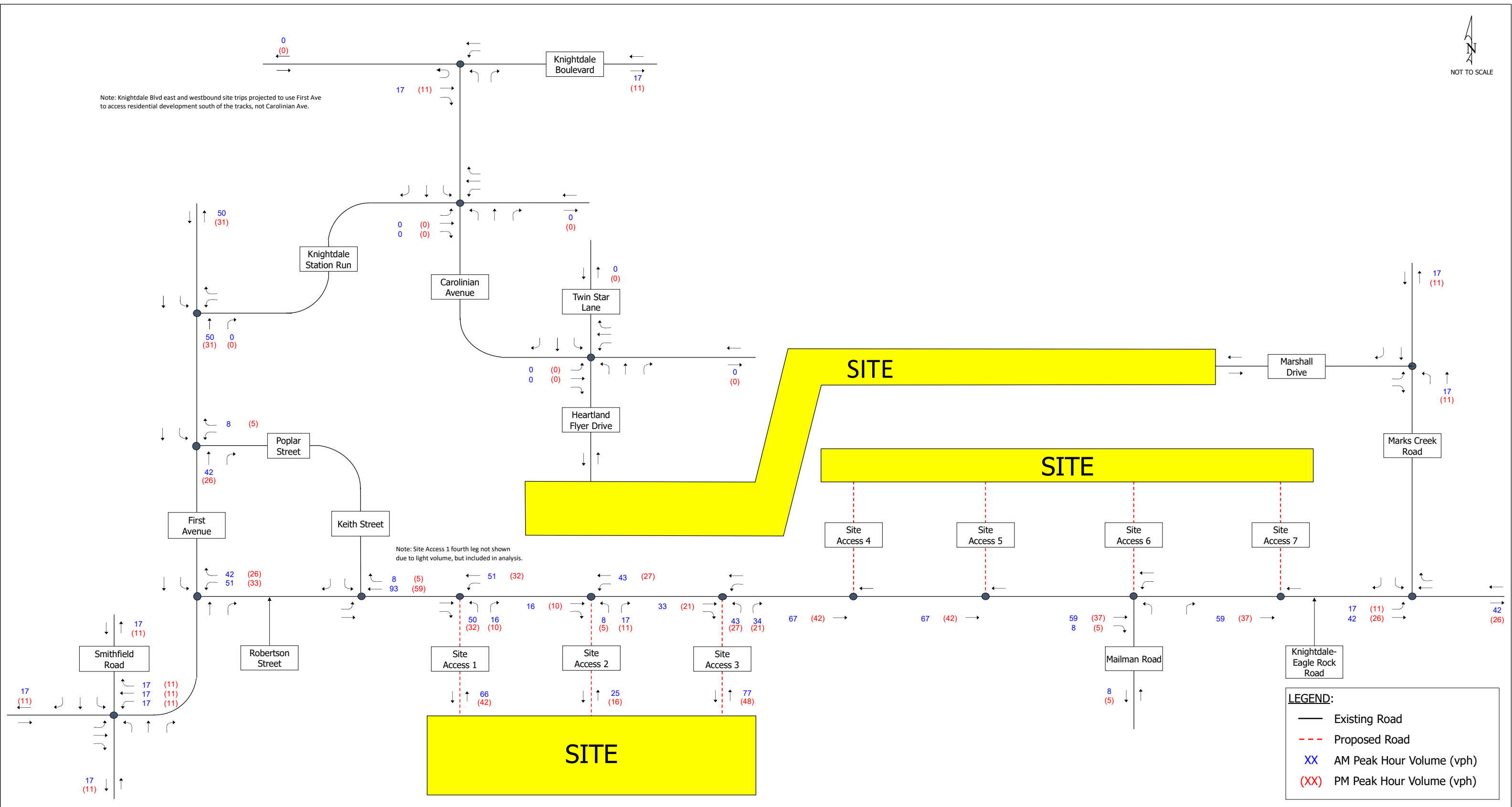
Robertson Street Assemblage Traffic Impact Analysis
 Trip Distribution Volumes (Residential - Ingress - South of Railroad Tracks)

Figure 4-8





Note: Knightdale Blvd east and westbound site trips projected to use First Ave to access residential development south of the tracks, not Carolinian Ave.



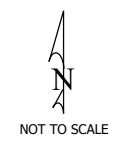
Robertson Street Assemblage Traffic Impact Analysis
 Trip Distribution Volumes (Residential - Egress - South of Railroad Tracks)

Figure 4-9

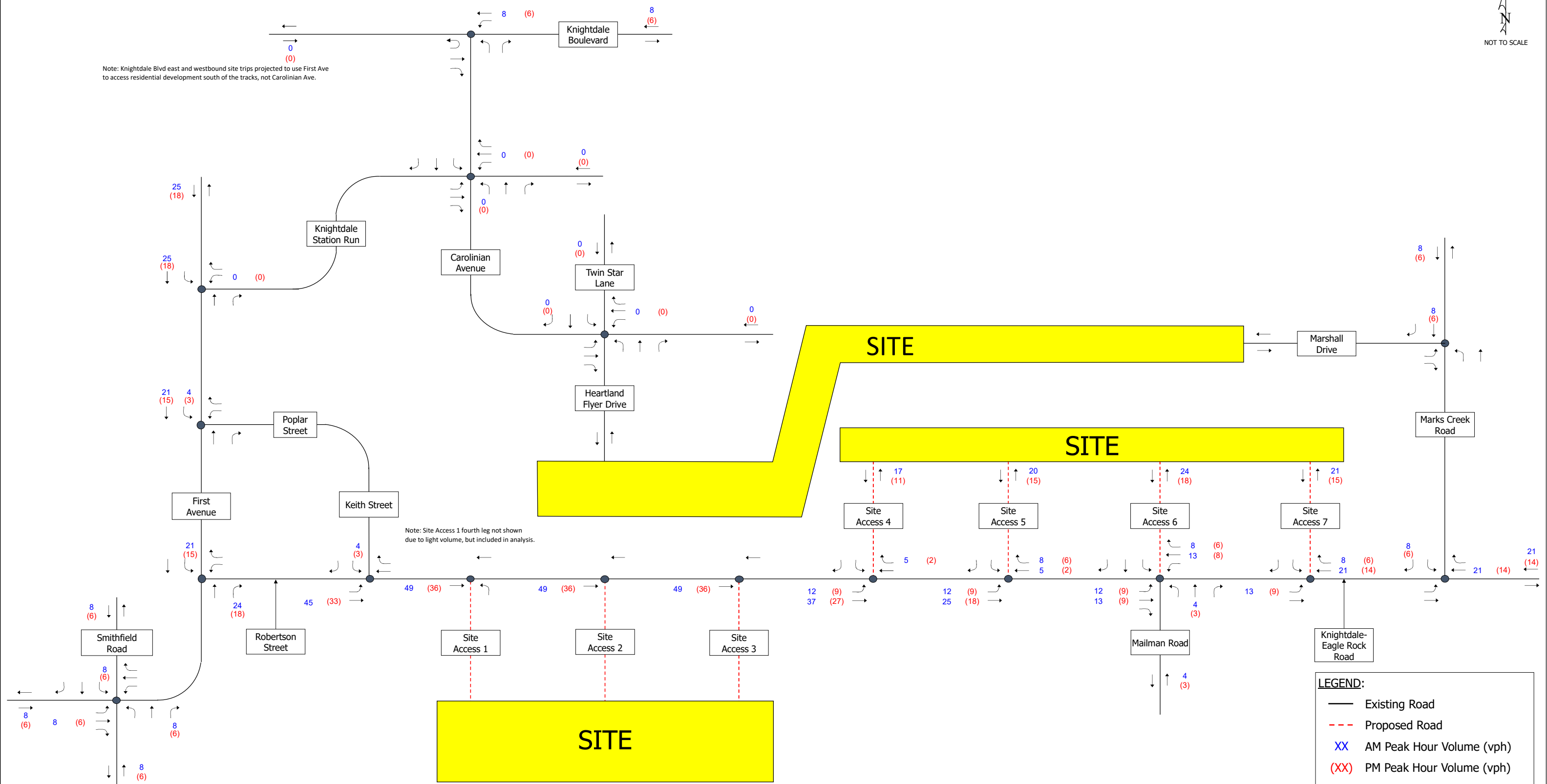


LEGEND:

- Existing Road
- - - Proposed Road
- XX AM Peak Hour Volume (vph)
- (XX) PM Peak Hour Volume (vph)



Note: Knightdale Blvd east and westbound site trips projected to use First Ave to access residential development south of the tracks, not Carolinian Ave.



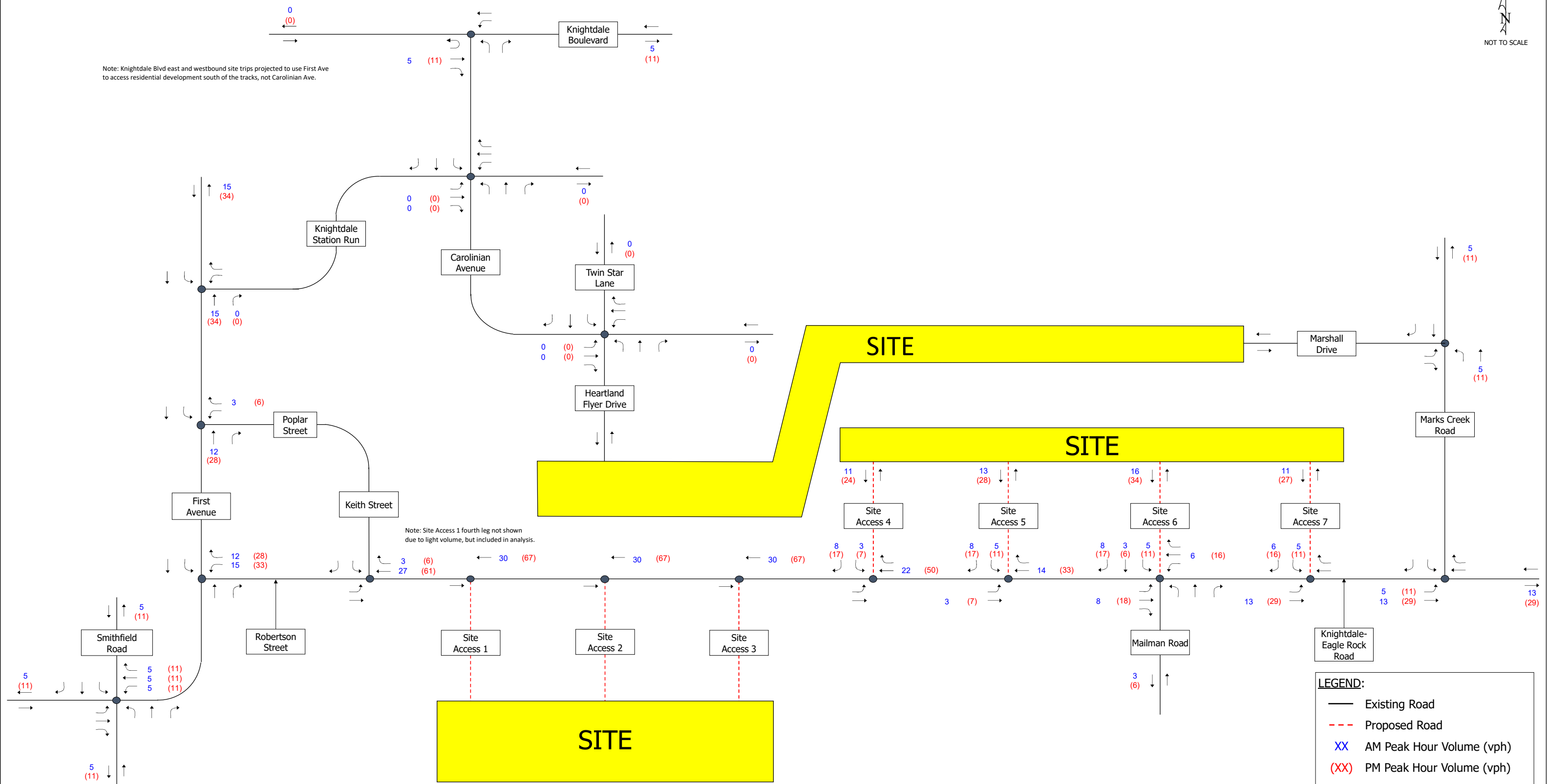
Note: Site Access 1 fourth leg not shown due to light volume, but included in analysis.

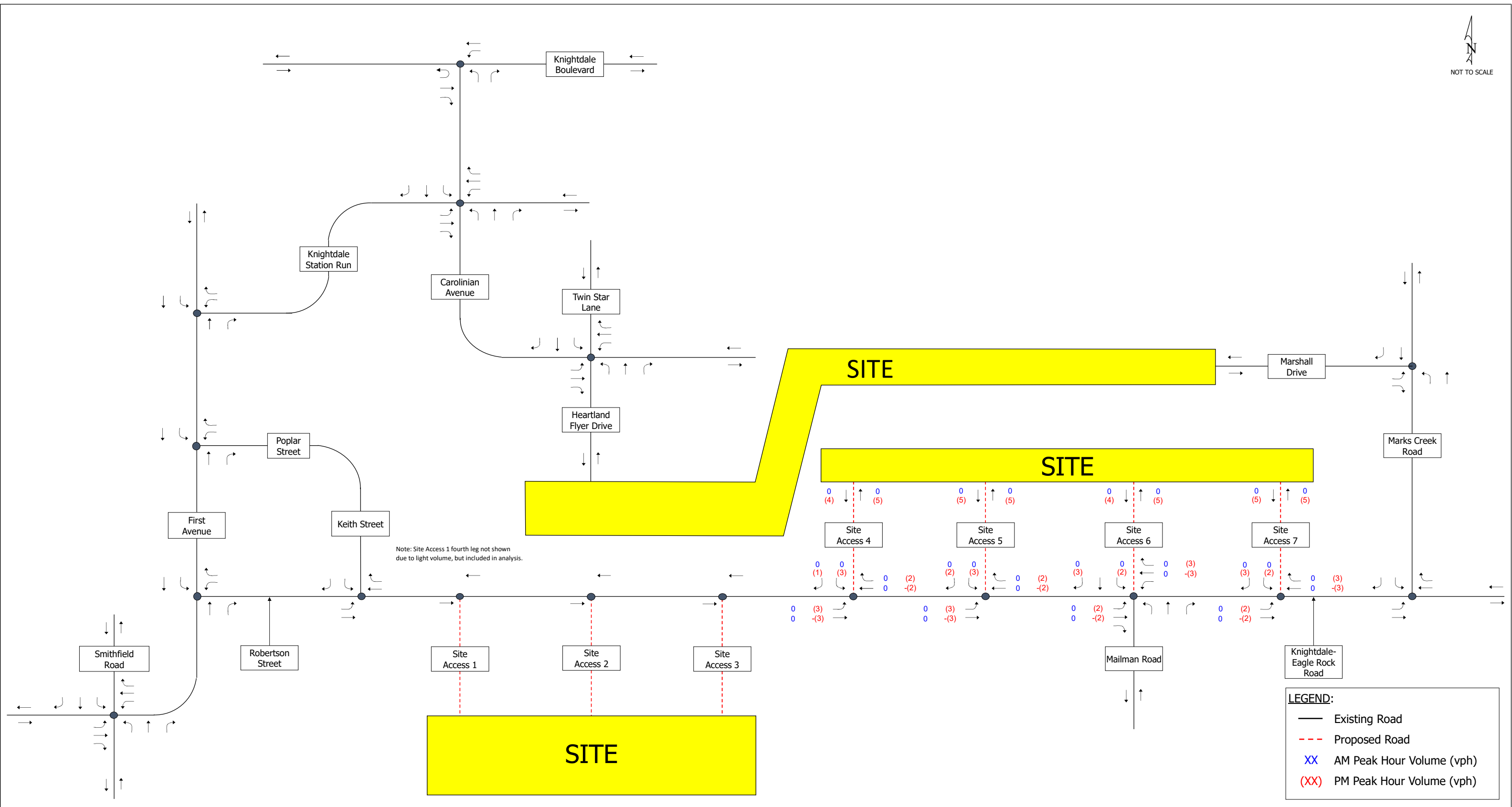


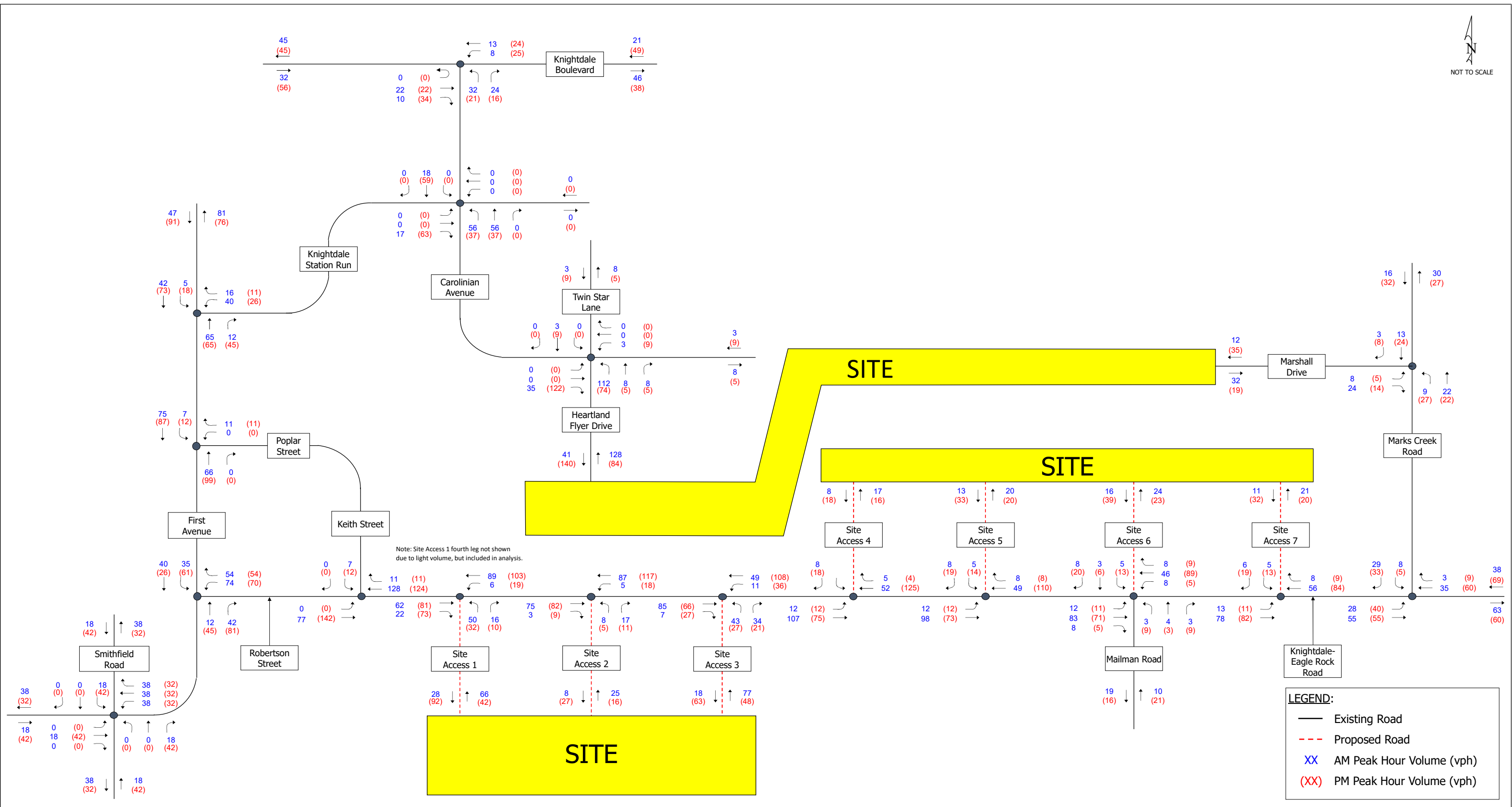
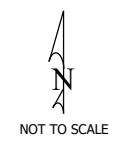
Robertson Street Assemblage Traffic Impact Analysis
Trip Distribution Volumes (Commercial - Ingress)

Figure 4-10

Note: Knightdale Blvd east and westbound site trips projected to use First Ave to access residential development south of the tracks, not Carolinian Ave.







Robertson Street Assemblage Traffic Impact Analysis
Total Site Trip Distribution Volumes

Figure 4-13

5 2028 BUILD CONDITION AND ANALYSIS

To complete the 2028 Build analyses (including the proposed development), the estimated site trips were added to the 2028 Background traffic volumes. The projected total volumes, along with the existing intersection geometry, were used to complete the capacity analyses.

5.1 2028 BUILD TRAFFIC VOLUMES

2028 Background traffic volumes (**Figure 3-4**) were added to the projected Robertson Street Assemblage development site trips (**Figure 4-13**) to generate the 2028 Build traffic volumes (background + site) shown in **Figure 5-1**.

To summarize, the 2028 Build traffic volumes (**Figure 5-1**) contain the following:

- 2022 traffic volumes grown exponentially for six (6) years at a 3% ambient growth rate (**Figure 3-1**);
- Area approved development site trips (**Figure 3-3**); and
- Total site trips generated by the subject development (see **Figure 4-13**).

5.2 2028 BUILD ANALYSIS

Table 5-1 summarizes the intersection LOS and delay based on the geometry shown in **Figure 2-2** and the 2028 Build traffic volumes shown in **Figure 5-1**. **Table 5-2** summarizes the 2028 Build roundabout LOS, delay, and V/C ratios. The corresponding SYNCHRO and SIDRA output is included in **Appendix D**.

The signalized intersection of Carolinian Avenue and Knightdale Boulevard is projected to operate at an overall LOS B during both 2028 Build AM and PM peak hours. All intersection approaches are projected to operate at a LOS C or better during both peak hours. Because all approaches are projected to operate acceptably, no improvements are recommended due to the proposed development's construction.

The Carolinian Avenue / Knightdale Station Run roundabout is projected to operate at an overall LOS A during both 2028 Build AM and PM peak hours. All approaches are projected to operate at a LOS A with a maximum 0.386 V/C ratio during both peak hours. Because all approaches are projected to operate acceptably, no improvements are recommended due to the proposed development's construction.

The westbound First Avenue / Knightdale Station Run unsignalized intersection approach is projected to operate at a LOS E during the 2028 Build PM peak hour. All other intersection approaches are projected to operate at a LOS D or better during both 2028 Build peak hours. Based on projected volumes and area development peaking characteristics, MUTCD's 4-hour and 8-hour volume warrants (typically required by the NCDOT for warranting signalization) will likely not be met. Additionally, the V/C ratio for the westbound approach is projected to be 0.681 for the PM peak hour. Construction of a northbound right turn lane was also considered; however, this does not mitigate the westbound approach, and it is not feasible as on-street parking for Knightdale Station Park would be lost. Therefore, no improvements are recommended at this intersection due to development construction.

All Carolinian Avenue / Heartland Flyer Drive / Twin Star Lane unsignalized intersection approaches are projected to operate at a LOS B or better during the 2028 Build AM and PM peak hours. Because all approaches are projected to operate acceptably, no improvements are recommended due to the proposed development's construction.

All Marks Creek Road / Marshall Drive unsignalized intersection approaches are projected to operate at a LOS A during the 2028 Build AM and PM peak hours. Because all approaches are projected to operate acceptably, no improvements are recommended due to the proposed development's construction.

All First Avenue / Poplar Street unsignalized intersection approaches are projected to operate at a LOS C or better during the 2028 Build AM and PM peak hours. Because all approaches are projected to operate acceptably, no improvements are recommended due to the proposed development's construction.

The westbound First Avenue / Robertson Street unsignalized intersection approach is projected to operate at a LOS F during both 2028 Build AM and PM peak hours. All other intersection approaches are projected to operate at a LOS A during both 2028 Build peak hours. To help mitigate capacity concerns at this intersection, a two-phase traffic signal should be installed. However, based on projected volumes, MUTCD's 4-hour and 8-hour volume warrants will likely not be met during the 2028 Build conditions. Therefore, it is recommended that this intersection be monitored for future signalization.

All Robertson Street / Keith Street unsignalized intersection approaches are projected to operate at a LOS C or better during the 2028 Build AM and PM peak hours. Because all approaches are projected to operate acceptably, no improvements are recommended due to the proposed development's construction.

The Robertson Street / Site Access 1 roundabout is projected to operate at an overall A during both 2028 Build AM and PM peak hours. All approaches are projected to operate at a LOS A during both peak hours. All approaches are projected to have a maximum 0.334 V/C ratio during both peak hours. Because all approaches are projected to operate acceptably, no improvements are recommended due to the proposed development's construction.

All Robertson Street / Site Access 2 unsignalized intersection approaches are projected to operate at a LOS B or better during both 2028 Build peak hours. Per the NCDOT Policy on Street and Driveway Access to North Carolina Highways Manual:

"Generally left and right turn lanes and tapers shall be considered when:

- *In accordance with G.S. 136-18(29), the average daily traffic meets or exceeds 4,000 vehicles per day on any secondary route (the average daily traffic should include both the existing traffic plus traffic generated by the proposed development)"*

With the addition of proposed development site traffic, the 2028 AADT along Robertson Street is projected to exceed 4,000 VPD. Because of this, turn lanes were considered at Site Access 2. Per the nomograph (provided in the Driveway Manual – see **Appendix F**), and projected 2028 Build traffic volumes, no turn-lanes are recommended. Because all approaches are projected to operate acceptably, no improvements are recommended due to the proposed development's construction.

All Robertson Street / Site Access 3 unsignalized intersection approaches are projected to operate at a LOS B or better during both 2028 Build peak hours. Per the NCDOT Nomograph (see **Appendix F**) and projected 2028 peak hour volumes, a 50-foot westbound left-turn lane (with appropriate taper) is recommended. Per **Table 5-3**, following this improvement, all approaches are projected to continue to operate acceptably. No additional improvements are recommended at this intersection due to the proposed development's construction.

All Robertson Street / Site Access 4 unsignalized intersection approaches are projected to operate at a LOS B or better during both 2028 Build peak hours. Per the NCDOT Nomograph (see **Appendix F**) and projected 2028 peak hour volumes, no turn-lanes are recommended. No additional improvements are recommended at this intersection due to the proposed development's construction.

All Robertson Street / Site Access 5 unsignalized intersection approaches are projected to operate at a LOS B or better during both 2028 Build peak hours. Per the NCDOT Nomograph (see **Appendix F**) and projected 2028 peak hour volumes, no turn-lanes are recommended. No additional improvements are recommended at this intersection due to the proposed development's construction.

All Robertson Street / Knightdale Eagle Rock Road / Site Access 6 / Mailman Road unsignalized intersection approaches are projected to operate at a LOS B or better during the 2028 Build AM and PM peak hours. Per the NCDOT Nomograph (see **Appendix F**) and projected 2028 peak hour volumes, no turn-lanes are recommended. No additional improvements are recommended at this intersection due to the proposed development's construction.

All Robertson Street / Site Access 7 unsignalized intersection approaches are projected to operate at a LOS B or better during both 2028 Build peak hours. Per the NCDOT Nomograph (see **Appendix F**) and projected 2028 peak hour volumes, no turn-lanes are recommended. No additional improvements are recommended at this intersection due to the proposed development's construction.

All Knightdale Eagle Road / Marks Creek Road unsignalized intersection are projected to operate at a LOS B or better during the 2028 Build AM and PM peak hours. Because all approaches are projected to operate acceptably, no improvements are recommended due to the proposed development's construction.

The signalized intersection of Smithfield Road and First Avenue is projected to operate at an overall LOS C and F during the 2028 Build AM and PM peak hours, respectively. The east and southbound approaches are projected to operate at LOS F during the 2028 Build PM peak hour. All other intersection approaches are projected to operate at a LOS D or better during both peak hours. Heavy eastbound left-turn volumes from S First Avenue onto N Smithfield Road and southbound right-turn volumes from N Smithfield Road to S First Avenue cause the intersection to operate unacceptably. To allow this intersection to operate acceptably, an exclusive eastbound left-turn lane and southbound right-turn lane are necessary. Existing right-of-way is not currently available to construct either movement. Additionally, the proposed development is not projected to add additional traffic to either movement during either peak hour. Because of this, no improvements are recommended at this intersection due to the proposed development's construction.

**Table 5-1: Intersection Level of Service and Delay Summary
2028 Build Traffic Volumes**

Intersection	Movement and Approach	AM PEAK HOUR		PM PEAK HOUR	
		Delay ¹ (sec/veh)	LOS ¹	Delay ¹ (sec/veh)	LOS ¹
1: Carolinian Ave & Knightdale Blvd	EB Approach	14.4	B	18.3	B
	WB Approach	8.9	A	4.5	A
	NB Approach	20.7	C	29.9	C
	Overall	12.7	B	14.3	B
3: First Ave & Knightdale Station Run	WB Approach	33.1	D	46.5	F
	NB Approach	0.0	A	0.0	A
	SB Approach	1.0	A	1.6	A
4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave	EB Approach	0.6	A	0.4	A
	WB Approach	1.2	A	2.3	A
	NB Approach	10.5	B	10.9	B
	SB Approach	9.0	A	9.4	A
5: Marks Creek Rd & Marshall Dr	EB Approach	8.9	A	9.2	A
	NB Approach	1.3	A	2.8	A
	SB Approach	0.0	A	0.0	A
6: First Ave & Poplar St	WB Approach	13.0	B	16.5	C
	NB Approach	0.0	A	0.0	A
	SB Approach	0.4	A	0.6	A
7: First Ave & Robertson St	WB Approach	89.1	F	290.0	F
	NB Approach	0.0	A	0.0	A
	SB Approach	2.1	A	3.2	A
8: Robertson St & Keith St	EB Approach	0.2	A	0.3	A
	WB Approach	0.0	A	0.0	A
	SB Approach	12.3	B	15.1	C
10: Site Access 2 & Robertson St	EB Approach	0.0	A	0.0	A
	WB Approach	0.1	A	0.4	A
	NB Approach	10.5	B	11.8	B
11: Site Access 3 & Robertson St	EB Approach	0.0	A	0.0	A
	WB Approach	0.3	A	0.9	A
	NB Approach	11.9	B	14.0	B
12: Robertson St & Site Access 4	EB Approach	0.4	A	0.3	A
	WB Approach	0.0	A	0.0	A
	SB Approach	10.7	B	11.2	B
13: Robertson St & Site Access 5	EB Approach	0.4	A	0.3	A
	WB Approach	0.0	A	0.0	A
	SB Approach	10.8	B	12.3	B
14: Mailman Rd/Site Access 6 & Robertson St/Knightdale Eagle Rock Rd	EB Approach	0.4	A	0.3	A
	WB Approach	1.0	A	0.9	A
	NB Approach	12.5	B	13.9	B
	SB Approach	12.0	B	14.3	B
15: Knightdale Eagle Rock Rd & Site Access 7	EB Approach	8.9	A	10.8	B
	WB Approach	9.2	A	10.4	B
	SB Approach	7.9	A	8.5	A
16: Knightdale Eagle Rock Rd & Marks Creek Rd	EB Approach	1.5	A	1.2	A
	WB Approach	0.0	A	0.0	A
	SB Approach	11.7	B	13.0	B
17: Smithfield Rd & First Ave	EB Approach	36.8	D	190.7	F
	WB Approach	13.1	B	41.9	D
	NB Approach	34.6	C	31.1	C
	SB Approach	41.8	D	185.6	F
	Overall	31.8	C	126.0	F

¹ Overall intersection LOS and delay not reported for TWSC intersections.

* - 95th percentile queues for unsignalized intersections reported in number of vehicles.

**Table 5-2: Intersection Level of Service, Delay, and V/C Ratio Summary
2028 Build Traffic Volumes**

Intersection and Type of Control	Movement and Approach	AM PEAK HOUR			PM PEAK HOUR		
		Delay ¹ (sec/veh)	LOS ¹	V/C	Delay ¹ (sec/veh)	LOS ¹	V/C
2: Carolinian Avenue / Knightdale Station Run	EB Approach	6.5	A	0.274	4.3	A	0.133
	WB Approach	7.5	A	0.386	3.9	A	0.078
	NB Approach	7.8	A	0.295	4.0	A	0.128
	SB Approach	6.4	A	0.311	4.5	A	0.173
	Overall	7.0	A	0.386	4.2	A	0.173
9: Robertson Street / Site Access 1 / Site Access 1A	EB Approach	4.1	A	0.173	5.8	A	0.334
	WB Approach	5.1	A	0.256	5.2	A	0.274
	NB Approach	3.9	A	0.072	4.4	A	0.055
	SB Approach	4.1	A	0.015	4.1	A	0.015
	Overall	4.6	A	0.256	5.4	A	0.334

¹ Overall intersection LOS and delay reported for signalized intersections and roundabouts only.

**Table 5-3: Intersection Level of Service and Delay Summary
2028 Build Traffic Volumes with Recommended Improvements**

Intersection	Movement and Approach	AM PEAK HOUR		PM PEAK HOUR	
		Delay ¹ (sec/veh)	LOS ¹	Delay ¹ (sec/veh)	LOS ¹
11: Site Access 3 & Robertson St	EB Approach	0.0	A	0.0	A
	WB Approach	0.3	A	0.9	A
	NB Approach	11.9	B	14.0	B

¹ Overall intersection LOS and delay not reported for TWSC intersections.

* - 95th percentile queues for unsignalized intersections reported in number of vehicles.

5.3 2038 BUILD TRAFFIC VOLUMES

For the 2038 Horizon Build Year analyses (including the proposed development), the 2022 Existing traffic volumes were grown at a 3% ambient growth rate from 2022 to 2028 and a 1% ambient growth rate from 2028 to 2038 and added to the estimated site trips. The projected total volumes, along with the proposed intersection geometry (see **Figure 6-1**), were used to complete the capacity analyses.

The 2038 Build traffic volumes shown on **Figure 5-2** contain the following:

- Existing 2022 turning movement traffic count volumes grown at a 3% ambient growth rate from 2022 to 2028 and a 1% ambient growth rate from 2028 to 2038 (**Figure 3-2**);
- Area approved development site trips (**Figure 3-3**); and
- Total site trips generated by the subject development (**Figure 4-13**).

5.4 2038 BUILD ANALYSIS

Table 5-4 summarizes the intersection LOS and delay based on the 2038 Build traffic volumes (shown in **Figure 5-2**). The corresponding SYNCHRO and SIDRA output is included in **Appendix D**.

The signalized intersection of Carolinian Avenue and Knightdale Boulevard is projected to operate at an overall LOS B and LOS C during the 2038 Build AM and PM peak hours, respectively. All intersection approaches are projected to operate at a LOS D or better during both peak hours.

The Carolinian Avenue / Knightdale Station Run roundabout is projected to operate at an overall A during both 2038 Build AM and PM peak hours. All approaches are projected to operate at a LOS A during both peak hours. All approaches are projected to have a maximum 0.431 V/C ratio during both peak hours.

The westbound First Avenue / Knightdale Station Run unsignalized intersection approach is projected to operate at a LOS E and LOS F during the 2038 Build AM and PM peak hours, respectively. All other intersection approaches are projected to operate at a LOS A during both 2038 Build peak hours.

All Carolinian Avenue / Heartland Flyer Drive / Twin Star Lane unsignalized intersection approaches are projected to operate at a LOS B or better during the 2038 Build AM and PM peak hours.

All Marks Creek Road / Marshall Drive unsignalized intersection approaches are projected to operate at a LOS A during the 2038 Build AM and PM peak hours.

All First Avenue / Poplar Street unsignalized intersection approaches are projected to operate at a LOS C or better during the 2038 Build AM and PM peak hours.

The westbound First Avenue / Robertson Street unsignalized intersection approach is projected to operate at a LOS F during both 2038 Build AM and PM peak hours. All other intersection approaches are projected to operate at a LOS A during both 2038 Build peak hours.

All Robertson Street / Keith Street unsignalized intersection approaches are projected to operate at a LOS C or better during the 2038 Build AM and PM peak hours.

The Robertson Street / Site Access 1 roundabout is projected to operate at an overall A during both 2038 Build AM and PM peak hours. All approaches are projected to operate at a LOS A during both peak hours. All approaches are projected to have a maximum 0.352 V/C ratio during both peak hours.

All Robertson Street / Site Access 2 unsignalized intersection approaches are projected to operate at a LOS B or better during both 2038 Build peak hours.

All Robertson Street / Site Access 3 unsignalized intersection approaches are projected to operate at a LOS B or better during both 2038 Build peak hours.

All Robertson Street / Site Access 4 unsignalized intersection approaches are projected to operate at a LOS B or better during both 2038 Build peak hours.

All Robertson Street / Site Access 5 unsignalized intersection approaches are projected to operate at a LOS B or better during both 2038 Build peak hours.

All Robertson Street / Knightdale Eagle Rock Road / Site Access 6 / Mailman Road unsignalized intersection approaches are projected to operate at a LOS C or better during the 2038 Build AM and PM peak hours.

All Robertson Street / Site Access 7 unsignalized intersection approaches are projected to operate at a LOS B or better during both 2038 Build peak hours.

All Knightdale Eagle Road / Marks Creek Road unsignalized intersection are projected to operate at a LOS B or better during the 2038 Build AM and PM peak hours.

The signalized intersection of Smithfield Road and First Avenue is projected to operate at an overall LOS D and F during the 2038 Build AM and PM peak hours, respectively. The east and southbound approaches are projected to operate at LOS F during the PM peak hour. The southbound approach is projected to operate at LOS E during the AM peak hour. All other intersection approaches are projected to operate at a LOS D or better during both peak hours.

**Table 5-4: Intersection Level of Service and Delay Summary
2038 Build Traffic Volumes**

Intersection	Movement and Approach	AM PEAK HOUR		PM PEAK HOUR	
		Delay ¹ (sec/veh)	LOS ¹	Delay ¹ (sec/veh)	LOS ¹
1: Carolinian Ave & Knightdale Blvd	EB Approach	14.2	B	19.7	B
	WB Approach	10.1	B	4.7	A
	NB Approach	22.5	C	35.3	D
	Overall	13.5	B	15.5	C
3: First Ave & Knightdale Station Run	WB Approach	46.8	E	74.3	F
	NB Approach	0.0	A	0.0	A
	SB Approach	1.1	A	1.7	A
4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave	EB Approach	0.7	A	0.5	A
	WB Approach	1.1	A	2.2	A
	NB Approach	10.6	B	11.1	B
	SB Approach	9.0	A	9.4	A
5: Marks Creek Rd & Marshall Dr	EB Approach	8.9	A	9.2	A
	NB Approach	1.2	A	2.7	A
	SB Approach	0.0	A	0.0	A
6: First Ave & Poplar St	WB Approach	13.7	B	18.2	C
	NB Approach	0.0	A	0.0	A
	SB Approach	0.4	A	0.6	A
7: First Ave & Robertson St	WB Approach	151.2	F	452.7	F
	NB Approach	0.0	A	0.0	A
	SB Approach	2.1	A	3.2	A
8: Robertson St & Keith St	EB Approach	0.2	A	0.3	A
	WB Approach	0.0	A	0.0	A
	SB Approach	12.6	B	15.8	C
10: Site Access 2 & Robertson St	EB Approach	0.0	A	0.0	A
	WB Approach	0.1	A	0.4	A
	NB Approach	10.7	B	12.2	B
11: Site Access 3 & Robertson St	EB Approach	0.0	A	0.0	A
	WB Approach	0.3	A	0.8	A
	NB Approach	12.1	B	14.5	B
12: Robertson St & Site Access 4	EB Approach	0.4	A	0.3	A
	WB Approach	0.0	A	0.0	A
	SB Approach	10.9	B	11.5	B
13: Robertson St & Site Access 5	EB Approach	0.4	A	0.3	A
	WB Approach	0.0	A	0.0	A
	SB Approach	11.0	B	12.7	B
14: Mailman Rd/Site Access 6 & Robertson St/Knightdale Eagle Rock Rd	EB Approach	0.4	A	0.3	A
	WB Approach	1.0	A	1.0	A
	NB Approach	12.8	B	14.4	B
	SB Approach	12.4	B	15.0	C
15: Knightdale Eagle Rock Rd & Site Access 7	EB Approach	9.1	A	11.4	B
	WB Approach	9.5	A	10.8	B
	SB Approach	8.0	A	8.6	B
16: Knightdale Eagle Rock Rd & Marks Creek Rd	EB Approach	1.4	A	1.2	A
	WB Approach	0.0	A	0.0	A
	SB Approach	12.1	B	13.7	B
17: Smithfield Rd & First Ave	EB Approach	54.7	D	255.4	F
	WB Approach	14.1	B	50.2	D
	NB Approach	42.8	D	35.5	D
	SB Approach	59.4	E	249.0	F
	Overall	43.4	D	166.9	F

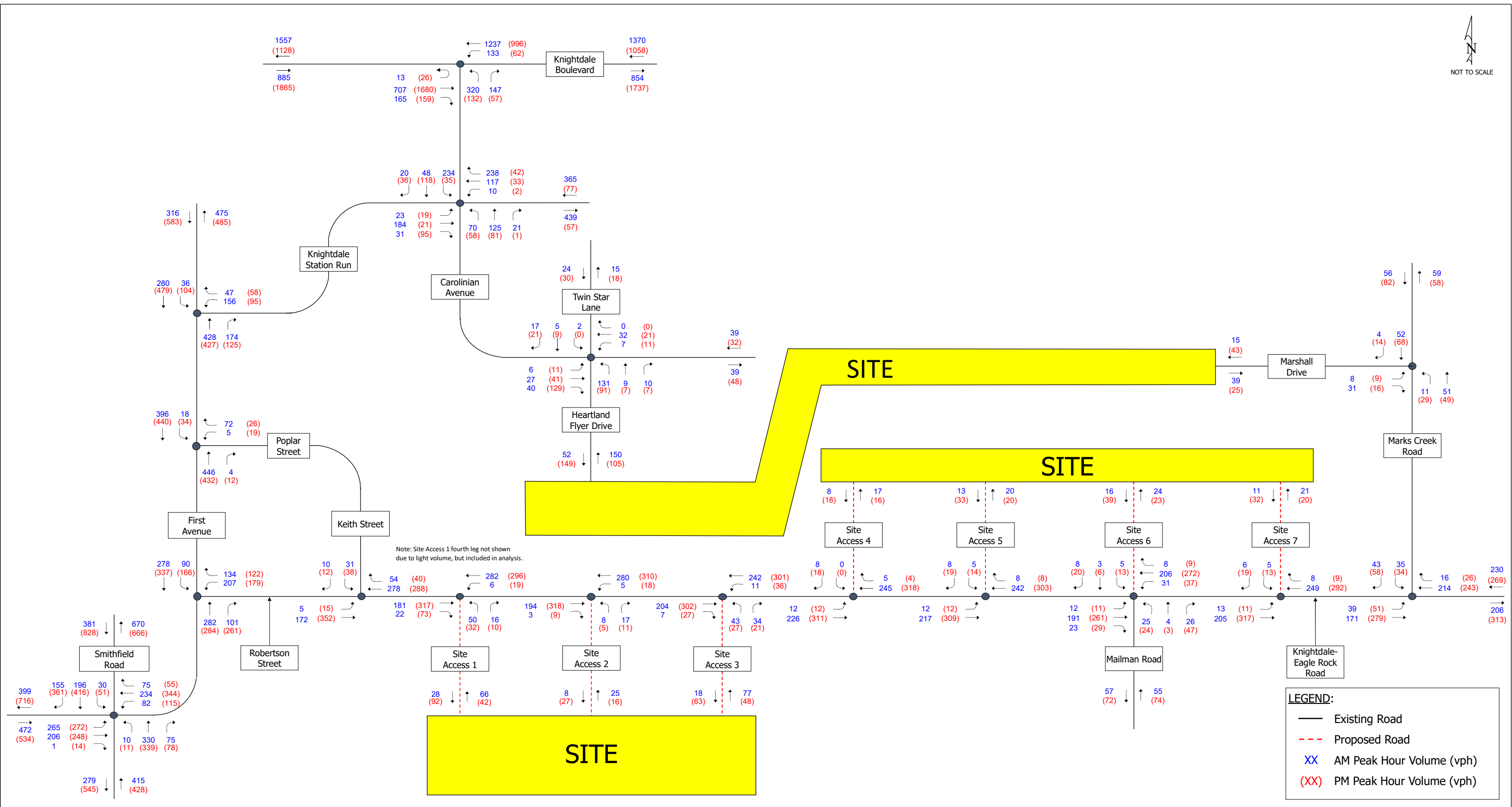
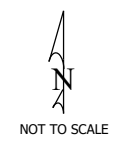
¹ Overall intersection LOS and delay not reported for TWSC intersections.

* - 95th percentile queues for unsignalized intersections reported in number of vehicles.

**Table 5-5: Intersection Level of Service, Delay, and V/C Ratio Summary
2038 Build Traffic Volumes**

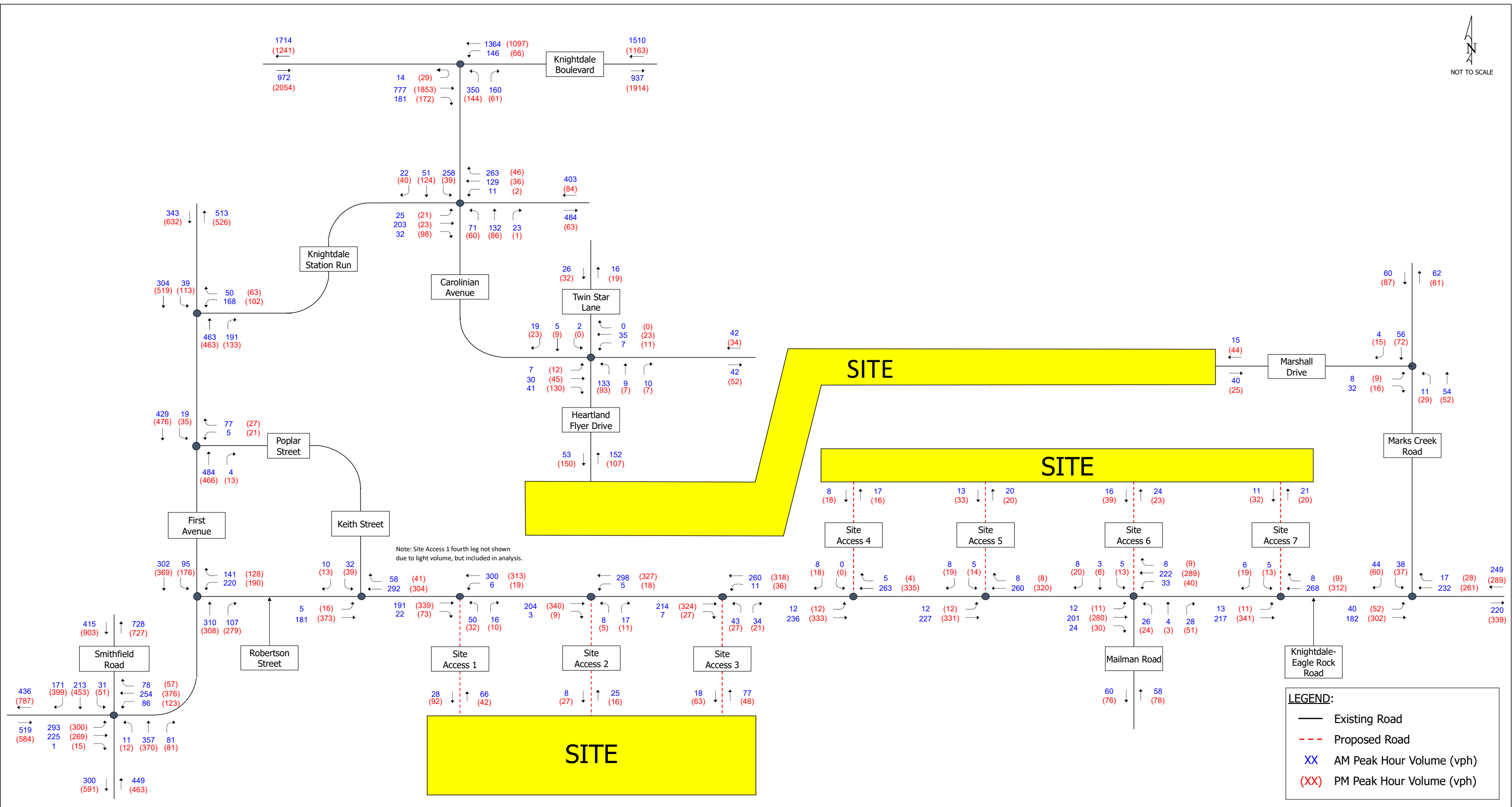
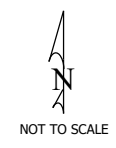
Intersection and Type of Control	Movement and Approach	AM PEAK HOUR			PM PEAK HOUR		
		Delay ¹ (sec/veh)	LOS ¹	V/C	Delay ¹ (sec/veh)	LOS ¹	V/C
2: Carolinian Avenue / Knightdale Station Run	EB Approach	7.1	A	0.309	4.5	A	0.141
	WB Approach	8.2	A	0.431	4.0	A	0.086
	NB Approach	8.5	A	0.326	4.1	A	0.136
	SB Approach	6.9	A	0.347	4.6	A	0.187
	Overall	7.7	A	0.431	4.3	A	0.187
9: Robertson Street / Site Access 1 / Site Access 1A	EB Approach	4.2	A	0.181	6.0	A	0.352
	WB Approach	5.3	A	0.272	5.4	A	0.289
	NB Approach	4.0	A	0.072	4.5	A	0.056
	SB Approach	4.2	A	0.015	4.2	A	0.015
	Overall	4.7	A	0.272	5.6	A	0.352

¹ Overall intersection LOS and delay reported for signalized intersections and roundabouts only.



Robertson Street Assemblage Traffic Impact Analysis 2028 Build Traffic Volumes

Figure 5-1



Robertson Street Assemblage Traffic Impact Analysis

2038 Build Traffic Volumes

Figure 5-2

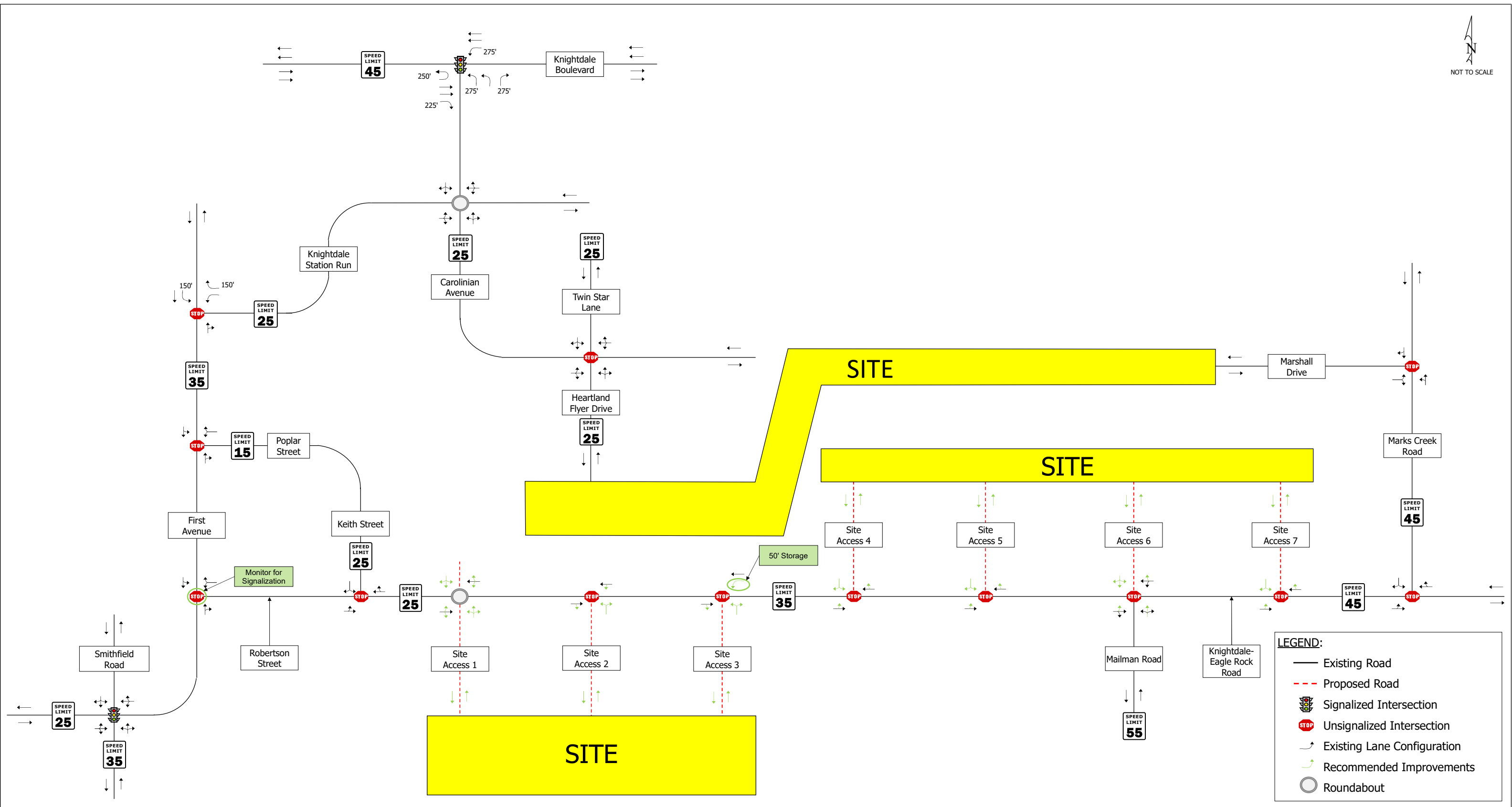
6 CONCLUSIONS AND RECOMMENDATIONS

Capacity analyses were performed for the following scenarios:

- 2022 Existing
- 2028 Background (existing + ambient growth + approved development traffic)
- 2028 Build (Background + site trips)
- 2038 Horizon Build (existing + ambient growth + approved development traffic)

In closing, the following improvements (see **Figure 6-1**) are recommended in conjunction with the construction of the proposed development:

- Robertson Street / First Avenue
 - Monitor for Signalization
- Robertson Street / Site Access 3
 - 50-foot westbound left-turn lane (with appropriate taper)



LEGEND:

- Existing Road
- - - Proposed Road
- 🚦 Signalized Intersection
- 🛑 Unsignalized Intersection
- ↔ Existing Lane Configuration
- ➡ Recommended Improvements
- ⊙ Roundabout



Robertson Street Assemblage Traffic Impact Analysis Proposed Lane Configuration

Figure 6-1

Appendix A – Scoping Information

From: [Brennan, Sean P](#)
To: [Andrew Spiliotis](#); [Brian Massengill](#)
Cc: [Jeff Hochanadel](#); [Kevin Lewis](#); [Ishak, Doumit Y](#); [Walker, Braden M](#); [Bunting, Clarence B](#); [Lineberger, Nicholas C](#); [Warren, Jeremy L](#); [Mate'a Tindal](#); [Beth Blackmon](#)
Subject: Re: [External] RE: Robertson TIA Scoping (Updated)
Date: Friday, May 13, 2022 11:18:23 AM
Attachments: [3B3DA6AD605147ABAE0ACD1DE27E60D4F125700511.png](#)

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Jeff,

I'm okay with the proposed scope with these changes.

Regards,

Sean Brennan, PE
Senior Assistant District Engineer
Division 5/District 1
Department of Transportation

919-733-3213 office
919-715-5778 fax
spbrennan@ncdot.gov

4009 District Drive (Physical Address)
Raleigh, NC 27607

1575 Mail Service Center (Mailing Address)
Raleigh, NC 27699-1575

cid:image001.png@01D10DA4.5CC88DA0



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From: Andrew Spiliotis <andrew.spiliotis@knightdalenc.gov>
Sent: Wednesday, May 4, 2022 2:02 PM
To: Brian Massengill <brian@natelli.com>
Cc: Jeff Hochanadel <Jeff.Hochanadel@timmons.com>; Kevin Lewis <kevin.lewis@knightdalenc.gov>; Brennan, Sean P <spbrennan@ncdot.gov>; Neidringhaus, Amy N <anneidringhaus@ncdot.gov>; Ishak, Doumit Y <dishak@ncdot.gov>; Walker, Braden M <bmwalker1@ncdot.gov>; Bunting, Clarence B <cbunting@ncdot.gov>; Lineberger, Nicholas C <nclineberger@ncdot.gov>; Warren, Jeremy L <jlwarren@ncdot.gov>; Mate'a Tindal <Mate'a.Tindal@timmons.com>; Beth Blackmon <Beth.Blackmon@timmons.com>
Subject: [External] RE: Robertson TIA Scoping (Updated)

CAUTION: External email. Do not click links or open attachments unless you verify. Send all suspicious email as an attachment to [Report Spam](#).

Good point Brian. I lean more towards including Marshall @ Marks Creek in that case. Not that I expect a huge trip assignment percentage or potential LOS issue at the intersection... more just wanting to model the trip assignment and study network comprehensively.

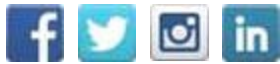
Andrew Spiliotis

Senior Planner – Transportation & Land Use



Town of Knightdale | KnightdaleNC.gov

950 Steeple Square Ct. | Knightdale, NC 27545 | 919-217-2247



This message and any attachments may be considered public record and are subject to public review.



From: [Brian Massengill](#)

Sent: Wednesday, May 4, 2022 1:55 PM

To: [Andrew Spiliotis](#)

Cc: [Jeff Hochanadel](#); [Kevin Lewis](#); [Brennan, Sean P](#); [Neidringhaus, Amy N](#); [Ishak, Doumit Y](#); [Walker, Braden M](#); [Bunting, Clarence B](#); [Lineberger, Nicholas C](#); [Warren, Jeremy L](#); [Mate'a Tindal](#); [Beth Blackmon](#)

Subject: Re: Robertson TIA Scoping (Updated)

Be Advised: This email originated from outside of the Town of Knightdale, NC

Jeff may have more insight, but Massey Farm Road doesn't connect to Marks Creek except via offroad vehicles. It's more of a path through the woods.

Marshall Drive is more of a "potential" possibility for connection, but it is currently a private drive.

Brian Massengill
Natelli Communities
919 868 3102

On Wed, May 4, 2022 at 1:27 PM Andrew Spiliotis <andrew.spiliotis@knightdalenc.gov> wrote:

Jeff, thank you for running this change through the TIA process. Overall the updated MOU looks good. Please run your proposed trip assignment distributions by us whenever you have them prepared. Also, I wonder if we should add either Massey Farm Rd/Marks Creek Rd or Marshall Dr/Marks Creek Rd as study network intersections now that more trips will travel through those intersections as the most direct route to I-87/Wendell Falls area now that the development's railroad crossing is no longer assumed. Massey Farm Rd seems like the more important roadway so I lean towards including that intersection over Marshall. I'm happy to talk through this further, just let me know.

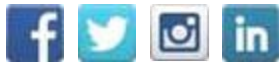
Andrew Spiliotis

Senior Planner – Transportation & Land Use



Town of Knightdale | knightdaleNC.gov

950 Steeple Square Ct. | Knightdale, NC 27545 | 919-217-2247



This message and any attachments may be considered public record and are subject to public review.



From: [Jeff Hochanadel](#)

Sent: Wednesday, April 27, 2022 4:09 PM

To: [Andrew Spiliotis](#); [Kevin Lewis](#); [Brennan, Sean P](#); [Neidringhaus, Amy N](#); [Ishak, Doumit Y](#); [Walker, Braden M](#); [Bunting, Clarence B](#); [Lineberger, Nicholas C](#); [Warren, Jeremy L](#)

Cc: [Mate'a Tindal](#); [Beth Blackmon](#); [Brian Massengill](#)

Subject: Robertson TIA Scoping (Updated)

Be Advised: This email originated from outside of the Town of Knightdale, NC

All,

As you are aware, Timmons Group is currently working on a TIA for the subject project. I have

attached TIA scoping meeting minutes (held 12/16/21) for the subject project. At this meeting, it was assumed that a rail crossing would be permitted, providing site traffic access to/from Robertson Street (from the northern development portion). Since this meeting, the rail crossing has been denied and the site has been redesigned to include additional connections to the north (along with additional residential units).

I would like to rescope the subject project. I will be happy to meet to discuss the project, or I am happy to scope via email. Listed below are the project assumptions (updated site sketch attached):

- The project build-out will include:
 - 178 townhomes (originally 158)
 - 476 single-family homes (originally 357)
- 344 units to be constructed south of the tracks
- 310 units to be constructed north of the tracks
- The project will be constructed by 2027
- Analyses will include:
 - 2022 Existing
 - 2028 Background
 - 2028 Build
 - 2038 Future
- The project study area intersections will include the following (new intersections in red):
 - S First Avenue / N First Avenue / N Smithfield Road *
 - N First Avenue / Robertson Street *
 - N First Avenue / Poplar Street **
 - Robertson Street / Keith Street **
 - Robertson Street / Heartland Flyer Drive / Site Access 1
 - Robertson Street / Site Access 2
 - Robertson Street / Site Access 3
 - Robertson Street / Mailman Road **
 - Robertson Street / Knightdale Eagle Rock Road / Marks Creek Road **
 - Carolinian Avenue / Twin Star Lane / Heartland Flyer Drive *
 - Carolinian Avenue / Knightdale Station Run ^
 - Carolinian Avenue / Knightdale Blvd ^
 - N First Avenue / Knightdale Station Run ^

Note: Stubbed connections are shown to Massey Farm Road and Marshall Drive. As both roads are currently unpaved, no analyses are included.

- Traffic counts
 - Conducted December 2021 *

- Conducted January 2022 **
- To Be Conducted May 2022 ^

- 3% ambient growth rate through 2028 (Build + 1)
- 1% ambient growth rate between 2028 (Build + 1) and 2038 (Build + 10)
- There are no public improvement projects in the study area
- There are two approved developments within the study area:
 - Smithfield Road Mixed Use Development
 - To be constructed off Mailman Road

 - The Collection Development
 - To be constructed off Poplar Street / Keith Street

Jeff Hochanadel, PE, PTOE

Principal | North Carolina Transportation Group Leader

TIMMONS GROUP | www.timmons.com

5410 Trinity Rd, Suite 102 | Raleigh, NC 27607

Office: 919.866.4511 | Fax: 919.859.5663

Cell: 919.426.8405

jeff.hochanadel@timmons.com

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Appendix B – Traffic Counts



TRAFFIC DATA COLLECTION

File Name : Knightdale (N First Ave and Knightdale Station Run)
 Site Code :
 Start Date : 5/12/2022
 Page No : 1

Groups Printed- Cars + - Trucks

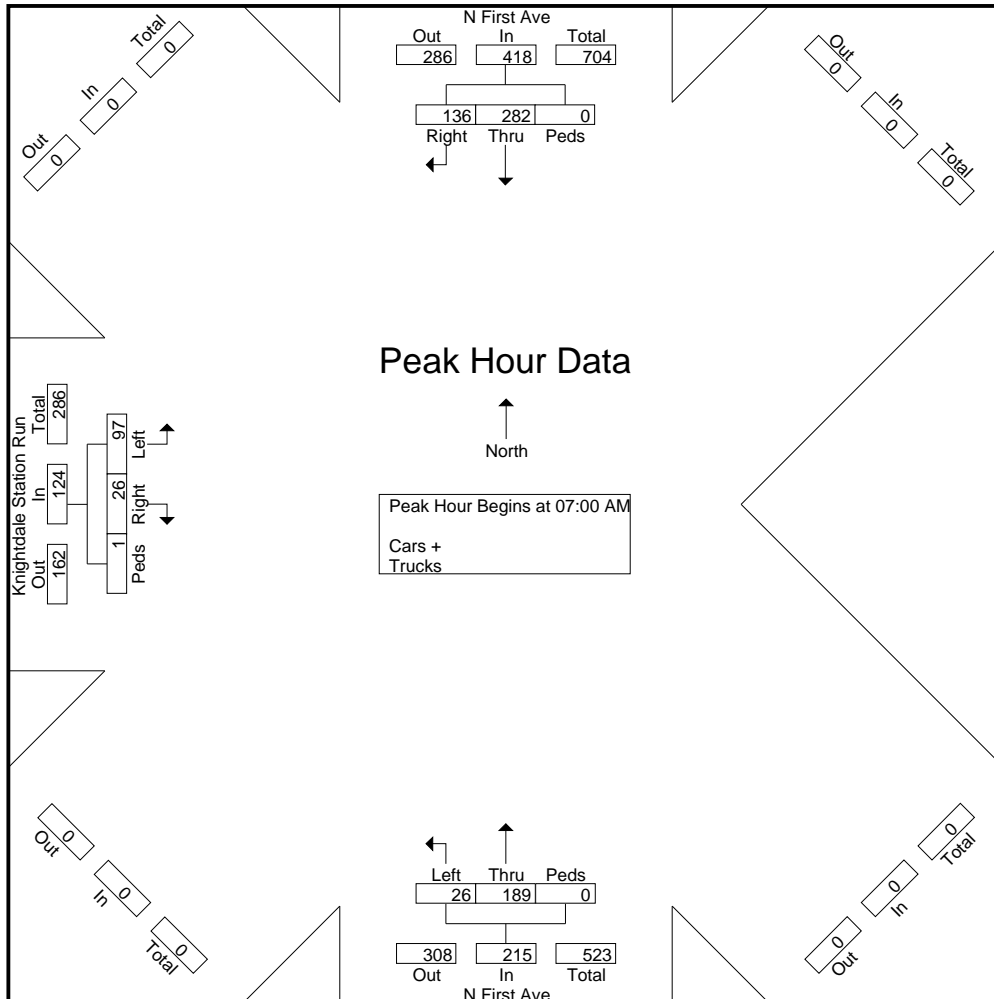
Start Time	N First Ave Southbound				N First Ave Northbound				Knightdale Station Run Eastbound				Int. Total
	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	
07:00 AM	20	86	0	106	44	7	0	51	1	7	0	8	165
07:15 AM	47	62	0	109	56	6	0	62	3	24	1	28	199
07:30 AM	53	66	0	119	46	10	0	56	14	31	0	45	220
07:45 AM	16	68	0	84	43	3	0	46	8	35	0	43	173
Total	136	282	0	418	189	26	0	215	26	97	1	124	757
08:00 AM	9	53	0	62	46	5	0	51	3	4	0	7	120
08:15 AM	11	58	0	69	44	6	0	50	6	6	0	12	131
08:30 AM	4	42	0	46	47	3	0	50	9	10	0	19	115
08:45 AM	9	55	0	64	54	6	0	60	10	9	1	20	144
Total	33	208	0	241	191	20	0	211	28	29	1	58	510
Grand Total	169	490	0	659	380	46	0	426	54	126	2	182	1267
Apprch %	25.6	74.4	0		89.2	10.8	0		29.7	69.2	1.1		
Total %	13.3	38.7	0	52	30	3.6	0	33.6	4.3	9.9	0.2	14.4	
Cars +	169	474	0	643	366	46	0	412	53	126	2	181	1236
% Cars +	100	96.7	0	97.6	96.3	100	0	96.7	98.1	100	100	99.5	97.6
Trucks	0	16	0	16	14	0	0	14	1	0	0	1	31
% Trucks	0	3.3	0	2.4	3.7	0	0	3.3	1.9	0	0	0.5	2.4



TRAFFIC DATA COLLECTION

File Name : Knightdale (N First Ave and Knightdale Station Run)
 Site Code :
 Start Date : 5/12/2022
 Page No : 2

Start Time	N First Ave Southbound				N First Ave Northbound				Knightdale Station Run Eastbound				Int. Total
	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	20	86	0	106	44	7	0	51	1	7	0	8	165
07:15 AM	47	62	0	109	56	6	0	62	3	24	1	28	199
07:30 AM	53	66	0	119	46	10	0	56	14	31	0	45	220
07:45 AM	16	68	0	84	43	3	0	46	8	35	0	43	173
Total Volume	136	282	0	418	189	26	0	215	26	97	1	124	757
% App. Total	32.5	67.5	0		87.9	12.1	0		21	78.2	0.8		
PHF	.642	.820	.000	.878	.844	.650	.000	.867	.464	.693	.250	.689	.860





TRAFFIC DATA COLLECTION

File Name : Knightdale (N First Ave and Knightdale Station Run)
 Site Code :
 Start Date : 5/12/2022
 Page No : 1

Groups Printed- Cars + - Trucks

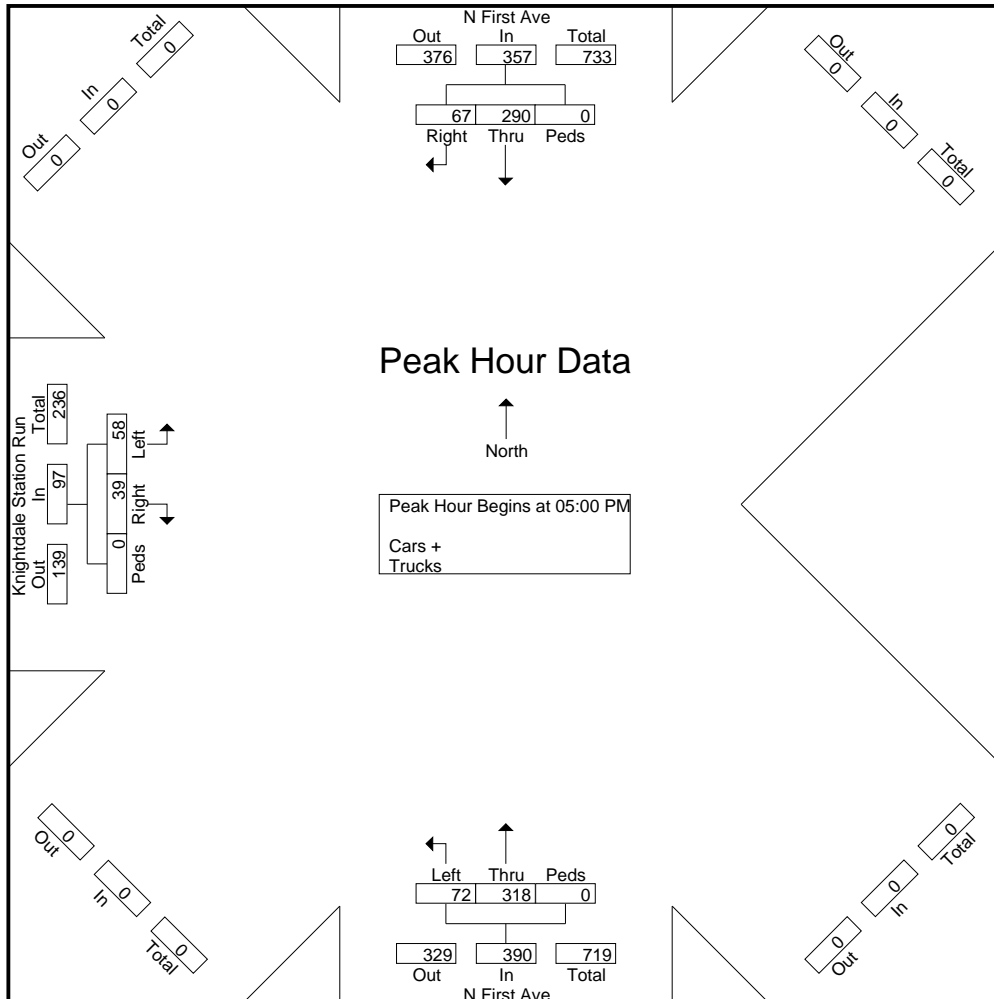
Start Time	N First Ave Southbound				N First Ave Northbound				Knightdale Station Run Eastbound				Int. Total
	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	
04:00 PM	10	51	0	61	62	10	0	72	7	11	0	18	151
04:15 PM	17	68	0	85	64	10	0	74	6	8	1	15	174
04:30 PM	19	64	0	83	57	9	0	66	8	21	0	29	178
04:45 PM	14	68	0	82	85	13	0	98	11	15	0	26	206
Total	60	251	0	311	268	42	0	310	32	55	1	88	709
05:00 PM	13	71	0	84	84	15	0	99	6	15	0	21	204
05:15 PM	17	72	0	89	82	11	0	93	5	11	0	16	198
05:30 PM	18	71	0	89	84	18	0	102	11	13	0	24	215
05:45 PM	19	76	0	95	68	28	0	96	17	19	0	36	227
Total	67	290	0	357	318	72	0	390	39	58	0	97	844
Grand Total	127	541	0	668	586	114	0	700	71	113	1	185	1553
Aprch %	19	81	0		83.7	16.3	0		38.4	61.1	0.5		
Total %	8.2	34.8	0	43	37.7	7.3	0	45.1	4.6	7.3	0.1	11.9	
Cars +	127	526	0	653	576	114	0	690	71	112	1	184	1527
% Cars +	100	97.2	0	97.8	98.3	100	0	98.6	100	99.1	100	99.5	98.3
Trucks	0	15	0	15	10	0	0	10	0	1	0	1	26
% Trucks	0	2.8	0	2.2	1.7	0	0	1.4	0	0.9	0	0.5	1.7



TRAFFIC DATA COLLECTION

File Name : Knightdale (N First Ave and Knightdale Station Run)
 Site Code :
 Start Date : 5/12/2022
 Page No : 2

Start Time	N First Ave Southbound				N First Ave Northbound				Knightdale Station Run Eastbound				Int. Total
	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	13	71	0	84	84	15	0	99	6	15	0	21	204
05:15 PM	17	72	0	89	82	11	0	93	5	11	0	16	198
05:30 PM	18	71	0	89	84	18	0	102	11	13	0	24	215
05:45 PM	19	76	0	95	68	28	0	96	17	19	0	36	227
Total Volume	67	290	0	357	318	72	0	390	39	58	0	97	844
% App. Total	18.8	81.2	0		81.5	18.5	0		40.2	59.8	0		
PHF	.882	.954	.000	.939	.946	.643	.000	.956	.574	.763	.000	.674	.930





TRAFFIC DATA COLLECTION

File Name : Knightdale (Knightdale Blvd and Carolinian Ave)
 Site Code :
 Start Date : 5/12/2022
 Page No : 1

Groups Printed- Cars + - Trucks

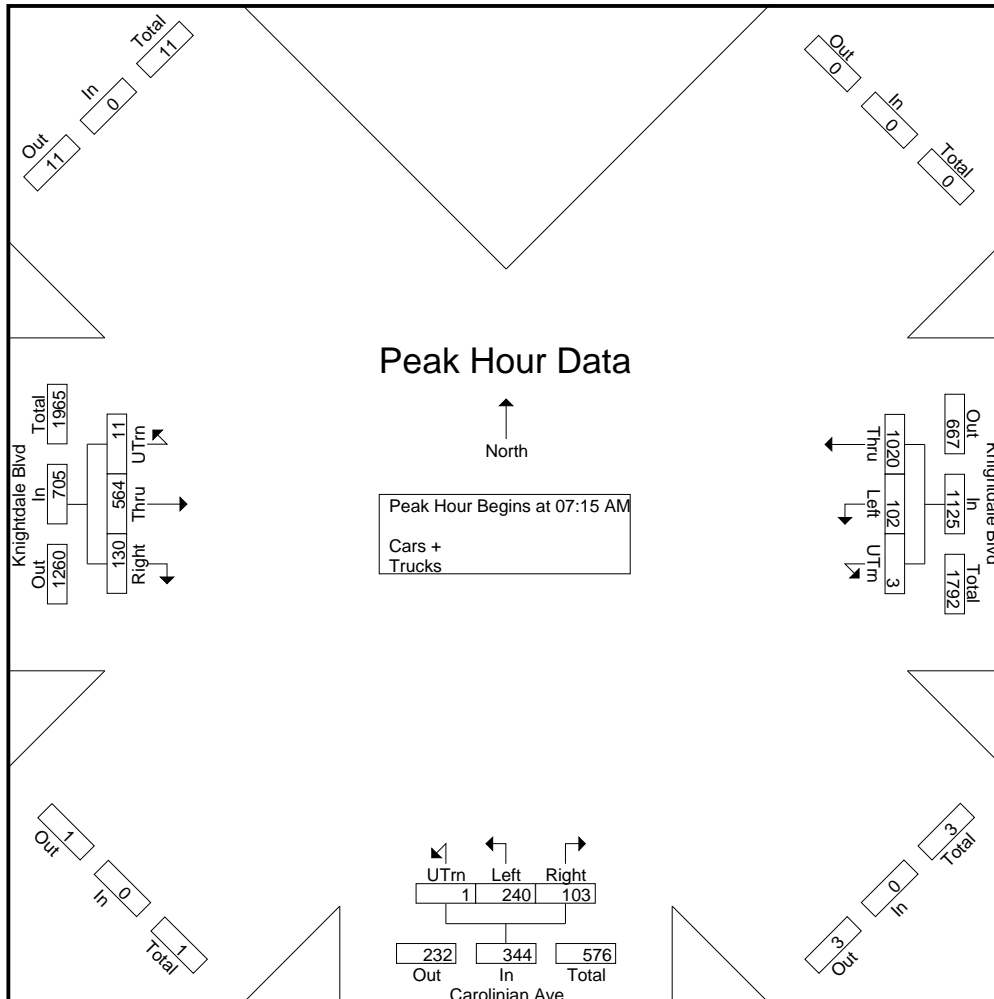
Start Time	Knightdale Blvd Westbound				Carolinian Ave Northbound				Knightdale Blvd Eastbound				Int. Total
	Thru	Left	UTrn	App. Total	Right	Left	UTrn	App. Total	Right	Thru	UTrn	App. Total	
07:00 AM	215	19	0	234	5	15	0	20	25	87	2	114	368
07:15 AM	260	34	0	294	24	53	0	77	49	139	3	191	562
07:30 AM	238	58	3	299	51	84	0	135	56	123	3	182	616
07:45 AM	288	6	0	294	23	71	1	95	18	174	2	194	583
Total	1001	117	3	1121	103	223	1	327	148	523	10	681	2129
08:00 AM	234	4	0	238	5	32	0	37	7	128	3	138	413
08:15 AM	224	3	0	227	2	12	0	14	18	148	4	170	411
08:30 AM	198	6	0	204	5	21	0	26	12	147	3	162	392
08:45 AM	238	3	0	241	1	18	0	19	18	128	5	151	411
Total	894	16	0	910	13	83	0	96	55	551	15	621	1627
Grand Total	1895	133	3	2031	116	306	1	423	203	1074	25	1302	3756
Apprch %	93.3	6.5	0.1		27.4	72.3	0.2		15.6	82.5	1.9		
Total %	50.5	3.5	0.1	54.1	3.1	8.1	0	11.3	5.4	28.6	0.7	34.7	
Cars +	1783	133	3	1919	116	306	1	423	200	975	25	1200	3542
% Cars +	94.1	100	100	94.5	100	100	100	100	98.5	90.8	100	92.2	94.3
Trucks	112	0	0	112	0	0	0	0	3	99	0	102	214
% Trucks	5.9	0	0	5.5	0	0	0	0	1.5	9.2	0	7.8	5.7



TRAFFIC DATA COLLECTION

File Name : Knightdale (Knightdale Blvd and Carolinian Ave)
 Site Code :
 Start Date : 5/12/2022
 Page No : 2

Start Time	Knightdale Blvd Westbound				Carolinian Ave Northbound				Knightdale Blvd Eastbound				Int. Total
	Thru	Left	UTrn	App. Total	Right	Left	UTrn	App. Total	Right	Thru	UTrn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	260	34	0	294	24	53	0	77	49	139	3	191	562
07:30 AM	238	58	3	299	51	84	0	135	56	123	3	182	616
07:45 AM	288	6	0	294	23	71	1	95	18	174	2	194	583
08:00 AM	234	4	0	238	5	32	0	37	7	128	3	138	413
Total Volume	1020	102	3	1125	103	240	1	344	130	564	11	705	2174
% App. Total	90.7	9.1	0.3		29.9	69.8	0.3		18.4	80	1.6		
PHF	.885	.440	.250	.941	.505	.714	.250	.637	.580	.810	.917	.909	.882





TRAFFIC DATA COLLECTION

File Name : Knightdale (Knightdale Blvd and Carolinian Ave)
 Site Code :
 Start Date : 5/12/2022
 Page No : 1

Groups Printed- Cars + - Trucks

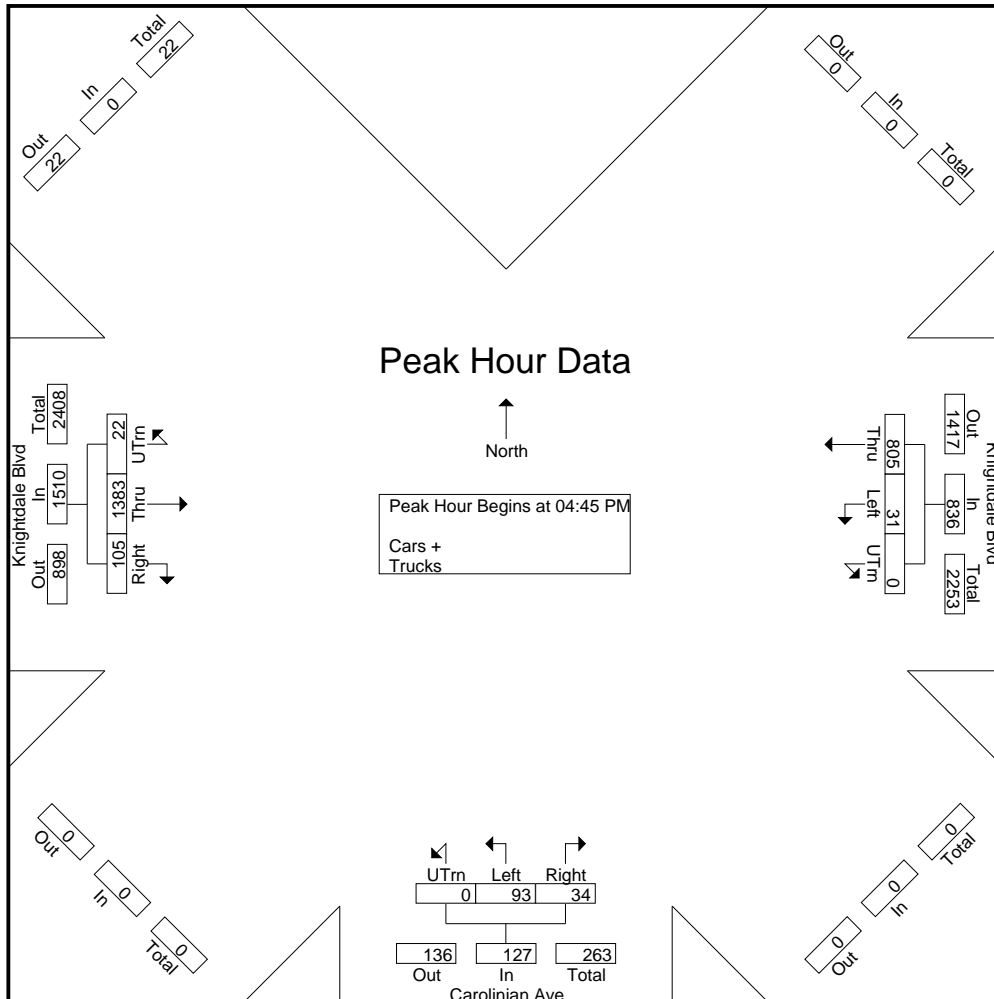
Start Time	Knightdale Blvd Westbound				Carolinian Ave Northbound				Knightdale Blvd Eastbound				Int. Total
	Thru	Left	UTrn	App. Total	Right	Left	UTrn	App. Total	Right	Thru	UTrn	App. Total	
04:00 PM	149	5	0	154	3	10	1	14	12	340	9	361	529
04:15 PM	194	9	0	203	4	19	0	23	23	276	13	312	538
04:30 PM	183	5	0	188	12	14	0	26	29	300	9	338	552
04:45 PM	175	9	0	184	11	28	0	39	27	315	9	351	574
Total	701	28	0	729	30	71	1	102	91	1231	40	1362	2193
05:00 PM	209	3	0	212	7	16	0	23	24	360	6	390	625
05:15 PM	225	9	0	234	7	20	0	27	32	368	6	406	667
05:30 PM	196	10	0	206	9	29	0	38	22	340	1	363	607
05:45 PM	181	4	0	185	7	21	0	28	19	337	4	360	573
Total	811	26	0	837	30	86	0	116	97	1405	17	1519	2472
Grand Total	1512	54	0	1566	60	157	1	218	188	2636	57	2881	4665
Apprch %	96.6	3.4	0		27.5	72	0.5		6.5	91.5	2		
Total %	32.4	1.2	0	33.6	1.3	3.4	0	4.7	4	56.5	1.2	61.8	
Cars +	1464	54	0	1518	60	157	1	218	187	2567	57	2811	4547
% Cars +	96.8	100	0	96.9	100	100	100	100	99.5	97.4	100	97.6	97.5
Trucks	48	0	0	48	0	0	0	0	1	69	0	70	118
% Trucks	3.2	0	0	3.1	0	0	0	0	0.5	2.6	0	2.4	2.5



TRAFFIC DATA COLLECTION

File Name : Knightdale (Knightdale Blvd and Carolinian Ave)
 Site Code :
 Start Date : 5/12/2022
 Page No : 2

Start Time	Knightdale Blvd Westbound				Carolinian Ave Northbound				Knightdale Blvd Eastbound				Int. Total
	Thru	Left	UTrn	App. Total	Right	Left	UTrn	App. Total	Right	Thru	UTrn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	175	9	0	184	11	28	0	39	27	315	9	351	574
05:00 PM	209	3	0	212	7	16	0	23	24	360	6	390	625
05:15 PM	225	9	0	234	7	20	0	27	32	368	6	406	667
05:30 PM	196	10	0	206	9	29	0	38	22	340	1	363	607
Total Volume	805	31	0	836	34	93	0	127	105	1383	22	1510	2473
% App. Total	96.3	3.7	0		26.8	73.2	0		7	91.6	1.5		
PHF	.894	.775	.000	.893	.773	.802	.000	.814	.820	.940	.611	.930	.927





TRAFFIC DATA COLLECTION

File Name : Knightdale(Carolinian and Twin Star) AM Peak
 Site Code :
 Start Date : 12/16/2021
 Page No : 1

Groups Printed- Cars + - Trucks

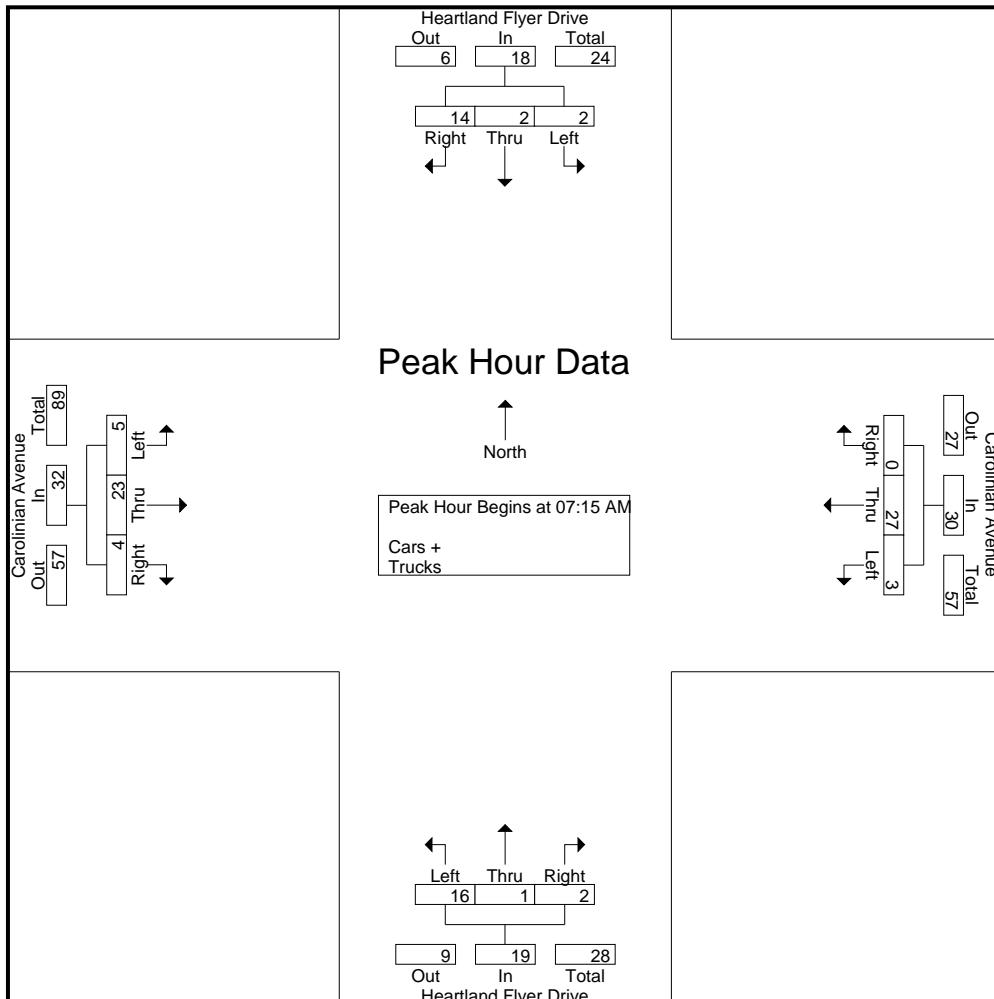
Start Time	Heartland Flyer Drive Southbound				Carolinian Avenue Westbound				Heartland Flyer Drive Northbound				Carolinian Avenue Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
07:00 AM	1	0	0	1	0	3	0	3	0	0	2	2	1	1	3	5	11
07:15 AM	3	0	1	4	0	6	1	7	0	0	5	5	1	4	0	5	21
07:30 AM	6	2	0	8	0	11	0	11	2	0	2	4	1	7	2	10	33
07:45 AM	3	0	1	4	0	5	1	6	0	0	5	5	1	6	3	10	25
Total	13	2	2	17	0	25	2	27	2	0	14	16	4	18	8	30	90
08:00 AM	2	0	0	2	0	5	1	6	0	1	4	5	1	6	0	7	20
08:15 AM	1	1	0	2	0	5	1	6	0	0	0	0	1	4	2	7	15
08:30 AM	1	1	0	2	0	3	1	4	1	0	2	3	2	2	2	6	15
08:45 AM	4	0	0	4	0	2	0	2	1	1	2	4	0	1	2	3	13
Total	8	2	0	10	0	15	3	18	2	2	8	12	4	13	6	23	63
Grand Total	21	4	2	27	0	40	5	45	4	2	22	28	8	31	14	53	153
Apprch %	77.8	14.8	7.4		0	88.9	11.1		14.3	7.1	78.6		15.1	58.5	26.4		
Total %	13.7	2.6	1.3	17.6	0	26.1	3.3	29.4	2.6	1.3	14.4	18.3	5.2	20.3	9.2	34.6	
Cars +	21	4	2	27	0	40	5	45	4	2	22	28	8	30	14	52	152
% Cars +	100	100	100	100	0	100	100	100	100	100	100	100	100	96.8	100	98.1	99.3
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	3.2	0	1.9	0.7



TRAFFIC DATA COLLECTION

File Name : Knightdale(Carolinian and Twin Star) AM Peak
 Site Code :
 Start Date : 12/16/2021
 Page No : 2

	Heartland Flyer Drive Southbound				Carolinian Avenue Westbound				Heartland Flyer Drive Northbound				Carolinian Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	3	0	1	4	0	6	1	7	0	0	5	5	1	4	0	5	21
07:30 AM	6	2	0	8	0	11	0	11	2	0	2	4	1	7	2	10	33
07:45 AM	3	0	1	4	0	5	1	6	0	0	5	5	1	6	3	10	25
08:00 AM	2	0	0	2	0	5	1	6	0	1	4	5	1	6	0	7	20
Total Volume	14	2	2	18	0	27	3	30	2	1	16	19	4	23	5	32	99
% App. Total	77.8	11.1	11.1		0	90	10		10.5	5.3	84.2		12.5	71.9	15.6		
PHF	.583	.250	.500	.563	.000	.614	.750	.682	.250	.250	.800	.950	1.00	.821	.417	.800	.750





TRAFFIC DATA COLLECTION

File Name : Knightdale(Carolinian and Twin Star) PM Peak
 Site Code :
 Start Date : 12/16/2021
 Page No : 1

Groups Printed- Cars + - Trucks

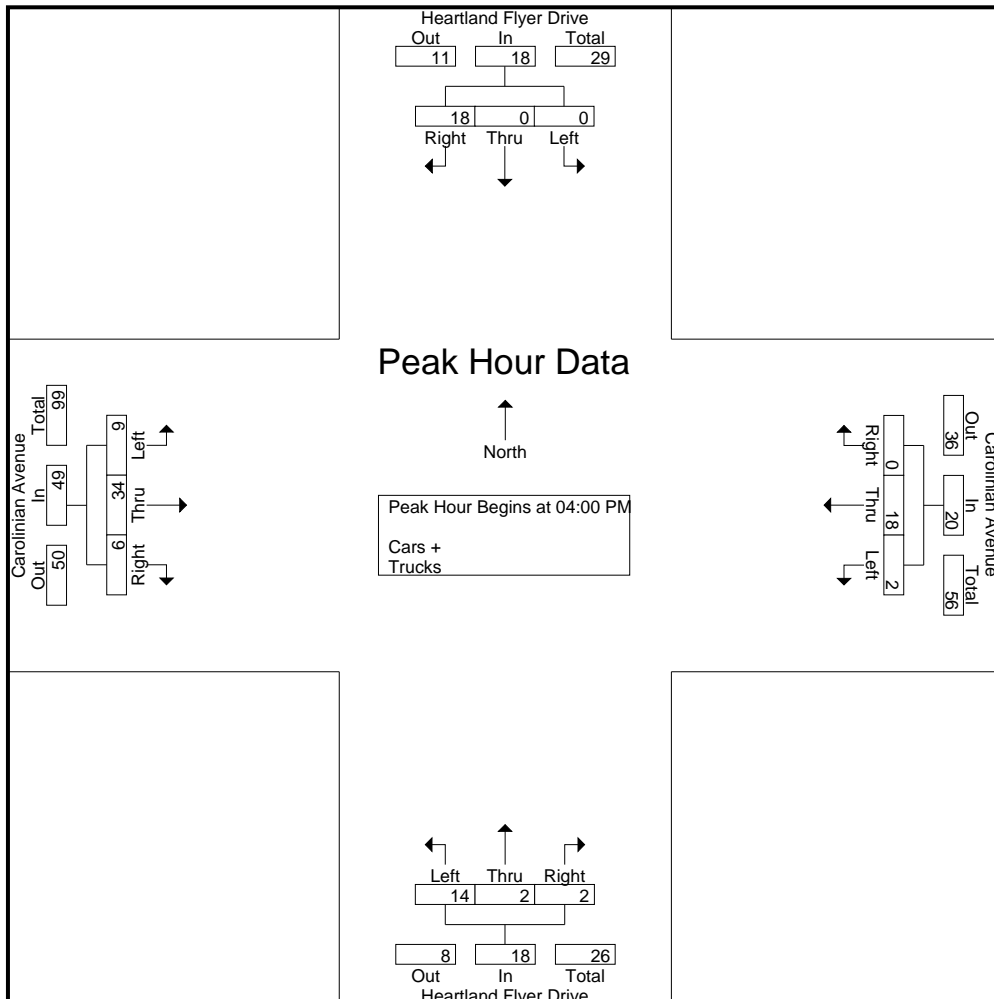
Start Time	Heartland Flyer Drive Southbound				Carolinian Avenue Westbound				Heartland Flyer Drive Northbound				Carolinian Avenue Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
04:00 PM	7	0	0	7	0	7	1	8	0	2	2	4	2	9	3	14	33
04:15 PM	7	0	0	7	0	2	0	2	0	0	7	7	2	5	1	8	24
04:30 PM	1	0	0	1	0	5	1	6	1	0	1	2	1	13	0	14	23
04:45 PM	3	0	0	3	0	4	0	4	1	0	4	5	1	7	5	13	25
Total	18	0	0	18	0	18	2	20	2	2	14	18	6	34	9	49	105
05:00 PM	1	0	0	1	0	2	0	2	0	0	5	5	4	6	1	11	19
05:15 PM	4	0	0	4	0	1	0	1	1	0	2	3	4	4	6	14	22
05:30 PM	1	0	0	1	0	5	0	5	0	0	2	2	1	6	4	11	19
05:45 PM	1	0	0	1	0	6	1	7	0	0	3	3	3	5	4	12	23
Total	7	0	0	7	0	14	1	15	1	0	12	13	12	21	15	48	83
Grand Total	25	0	0	25	0	32	3	35	3	2	26	31	18	55	24	97	188
Apprch %	100	0	0		0	91.4	8.6		9.7	6.5	83.9		18.6	56.7	24.7		
Total %	13.3	0	0	13.3	0	17	1.6	18.6	1.6	1.1	13.8	16.5	9.6	29.3	12.8	51.6	
Cars +	25	0	0	25	0	32	3	35	3	2	26	31	18	54	24	96	187
% Cars +	100	0	0	100	0	100	100	100	100	100	100	100	100	98.2	100	99	99.5
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	1.8	0	1	0.5



TRAFFIC DATA COLLECTION

File Name : Knightdale(Carolinian and Twin Star) PM Peak
 Site Code :
 Start Date : 12/16/2021
 Page No : 2

	Heartland Flyer Drive Southbound				Carolinian Avenue Westbound				Heartland Flyer Drive Northbound				Carolinian Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	7	0	0	7	0	7	1	8	0	2	2	4	2	9	3	14	33
04:15 PM	7	0	0	7	0	2	0	2	0	0	7	7	2	5	1	8	24
04:30 PM	1	0	0	1	0	5	1	6	1	0	1	2	1	13	0	14	23
04:45 PM	3	0	0	3	0	4	0	4	1	0	4	5	1	7	5	13	25
Total Volume	18	0	0	18	0	18	2	20	2	2	14	18	6	34	9	49	105
% App. Total	100	0	0		0	90	10		11.1	11.1	77.8		12.2	69.4	18.4		
PHF	.643	.000	.000	.643	.000	.643	.500	.625	.500	.250	.500	.643	.750	.654	.450	.875	.795





TRAFFIC DATA COLLECTION

File Name : Knightdale(First and Poplar)
 Site Code :
 Start Date : 1/13/2022
 Page No : 1

Groups Printed- Cars + - Trucks

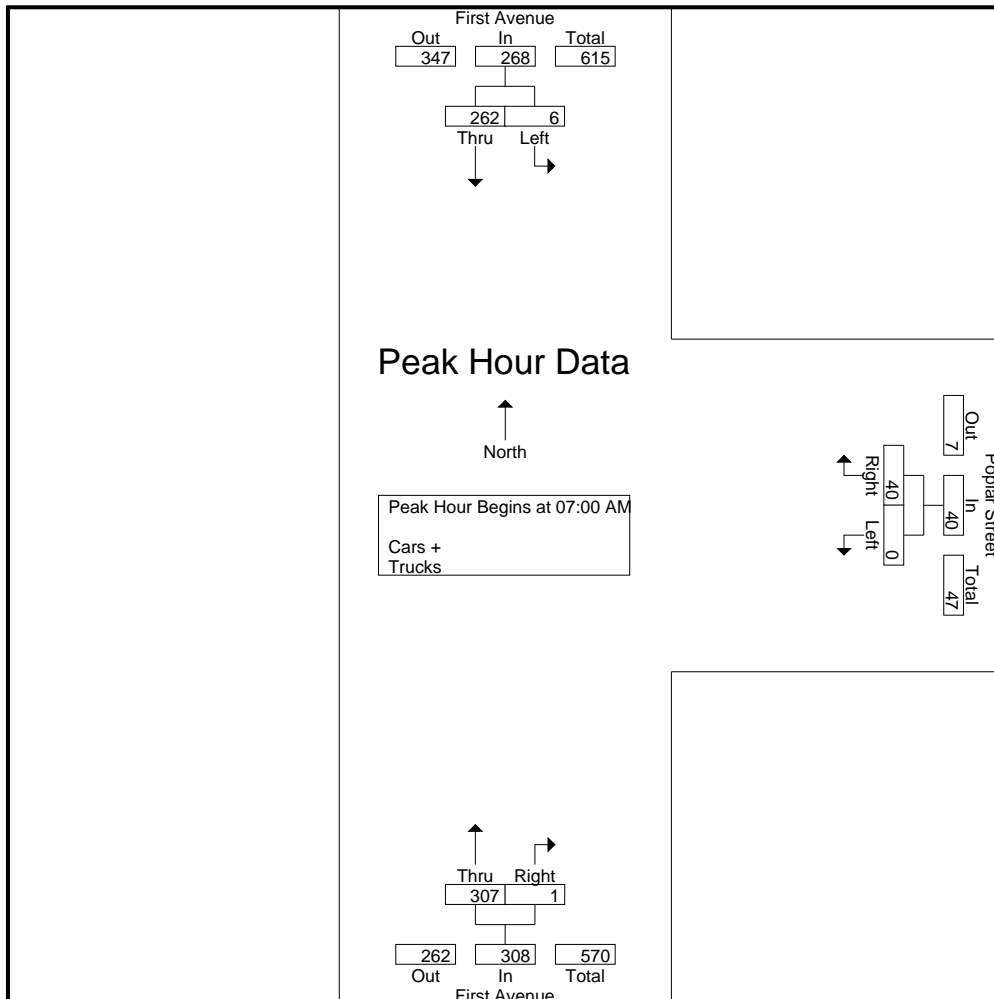
Start Time	First Avenue Southbound			Poplar Street Westbound			First Avenue Northbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
07:00 AM	53	1	54	10	0	10	0	86	86	150
07:15 AM	66	2	68	11	0	11	0	85	85	164
07:30 AM	77	1	78	14	0	14	0	89	89	181
07:45 AM	66	2	68	5	0	5	1	47	48	121
Total	262	6	268	40	0	40	1	307	308	616
08:00 AM	33	3	36	2	0	2	2	48	50	88
08:15 AM	40	1	41	3	0	3	0	60	60	104
08:30 AM	42	1	43	4	0	4	0	44	44	91
08:45 AM	40	1	41	6	0	6	0	56	56	103
Total	155	6	161	15	0	15	2	208	210	386
Grand Total	417	12	429	55	0	55	3	515	518	1002
Apprch %	97.2	2.8		100	0		0.6	99.4		
Total %	41.6	1.2	42.8	5.5	0	5.5	0.3	51.4	51.7	
Cars +	391	12	403	54	0	54	3	493	496	953
% Cars +	93.8	100	93.9	98.2	0	98.2	100	95.7	95.8	95.1
Trucks	26	0	26	1	0	1	0	22	22	49
% Trucks	6.2	0	6.1	1.8	0	1.8	0	4.3	4.2	4.9



TRAFFIC DATA COLLECTION

File Name : Knightdale(First and Poplar)
 Site Code :
 Start Date : 1/13/2022
 Page No : 2

Start Time	First Avenue Southbound			Poplar Street Westbound			First Avenue Northbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	53	1	54	10	0	10	0	86	86	150
07:15 AM	66	2	68	11	0	11	0	85	85	164
07:30 AM	77	1	78	14	0	14	0	89	89	181
07:45 AM	66	2	68	5	0	5	1	47	48	121
Total Volume	262	6	268	40	0	40	1	307	308	616
% App. Total	97.8	2.2		100	0		0.3	99.7		
PHF	.851	.750	.859	.714	.000	.714	.250	.862	.865	.851





TRAFFIC DATA COLLECTION

File Name : Knightdale(First and Poplar)
 Site Code :
 Start Date : 1/13/2022
 Page No : 1

Groups Printed- Cars + - Trucks

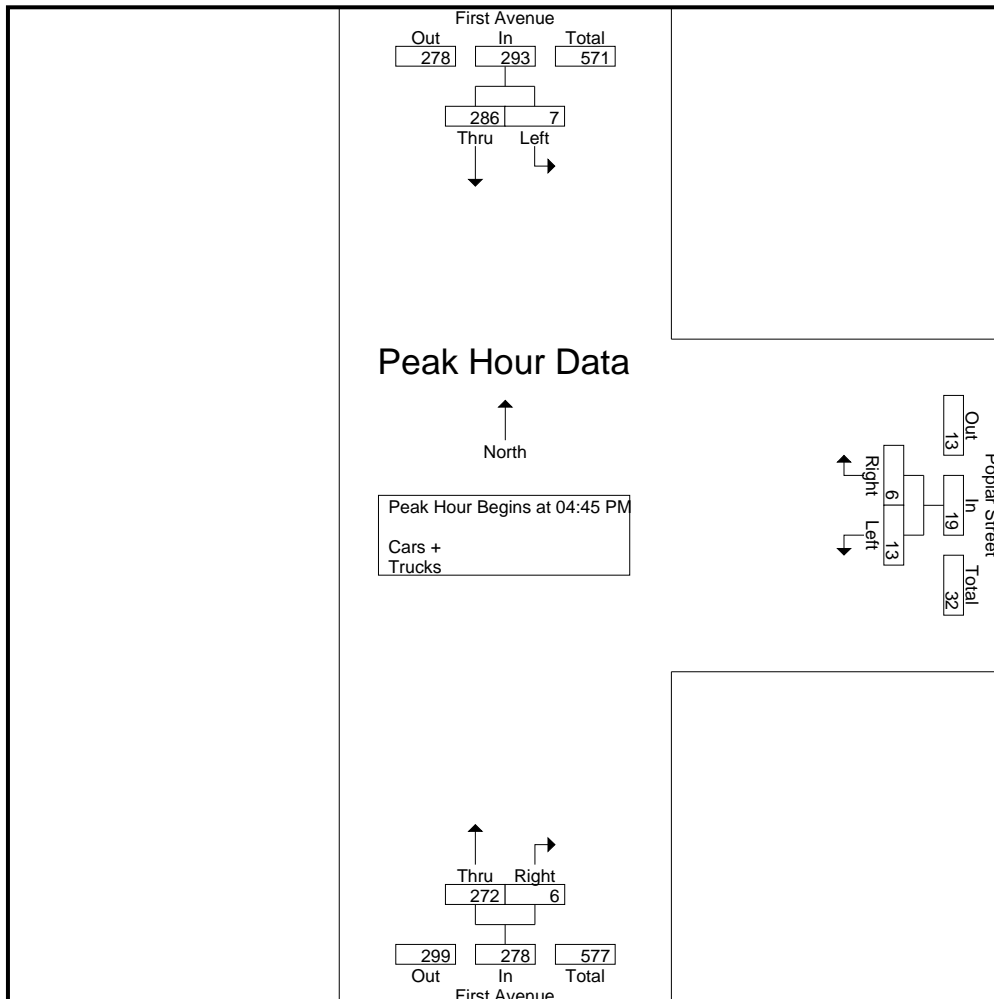
Start Time	First Avenue Southbound			Poplar Street Westbound			First Avenue Northbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
04:00 PM	47	3	50	1	1	2	1	64	65	117
04:15 PM	70	4	74	7	3	10	3	57	60	144
04:30 PM	64	3	67	4	2	6	1	64	65	138
04:45 PM	71	1	72	3	4	7	2	59	61	140
Total	252	11	263	15	10	25	7	244	251	539
05:00 PM	76	2	78	0	0	0	0	68	68	146
05:15 PM	74	1	75	1	6	7	3	64	67	149
05:30 PM	65	3	68	2	3	5	1	81	82	155
05:45 PM	71	4	75	6	1	7	1	53	54	136
Total	286	10	296	9	10	19	5	266	271	586
Grand Total	538	21	559	24	20	44	12	510	522	1125
Apprch %	96.2	3.8		54.5	45.5		2.3	97.7		
Total %	47.8	1.9	49.7	2.1	1.8	3.9	1.1	45.3	46.4	
Cars +	522	20	542	24	20	44	12	480	492	1078
% Cars +	97	95.2	97	100	100	100	100	94.1	94.3	95.8
Trucks	16	1	17	0	0	0	0	30	30	47
% Trucks	3	4.8	3	0	0	0	0	5.9	5.7	4.2



TRAFFIC DATA COLLECTION

File Name : Knightdale(First and Poplar)
 Site Code :
 Start Date : 1/13/2022
 Page No : 2

Start Time	First Avenue Southbound			Poplar Street Westbound			First Avenue Northbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	71	1	72	3	4	7	2	59	61	140
05:00 PM	76	2	78	0	0	0	0	68	68	146
05:15 PM	74	1	75	1	6	7	3	64	67	149
05:30 PM	65	3	68	2	3	5	1	81	82	155
Total Volume	286	7	293	6	13	19	6	272	278	590
% App. Total	97.6	2.4		31.6	68.4		2.2	97.8		
PHF	.941	.583	.939	.500	.542	.679	.500	.840	.848	.952





TRAFFIC DATA COLLECTION

File Name : Knightdale(First and Robertson) AM Peak
 Site Code :
 Start Date : 12/16/2021
 Page No : 1

Groups Printed- Cars + - Trucks

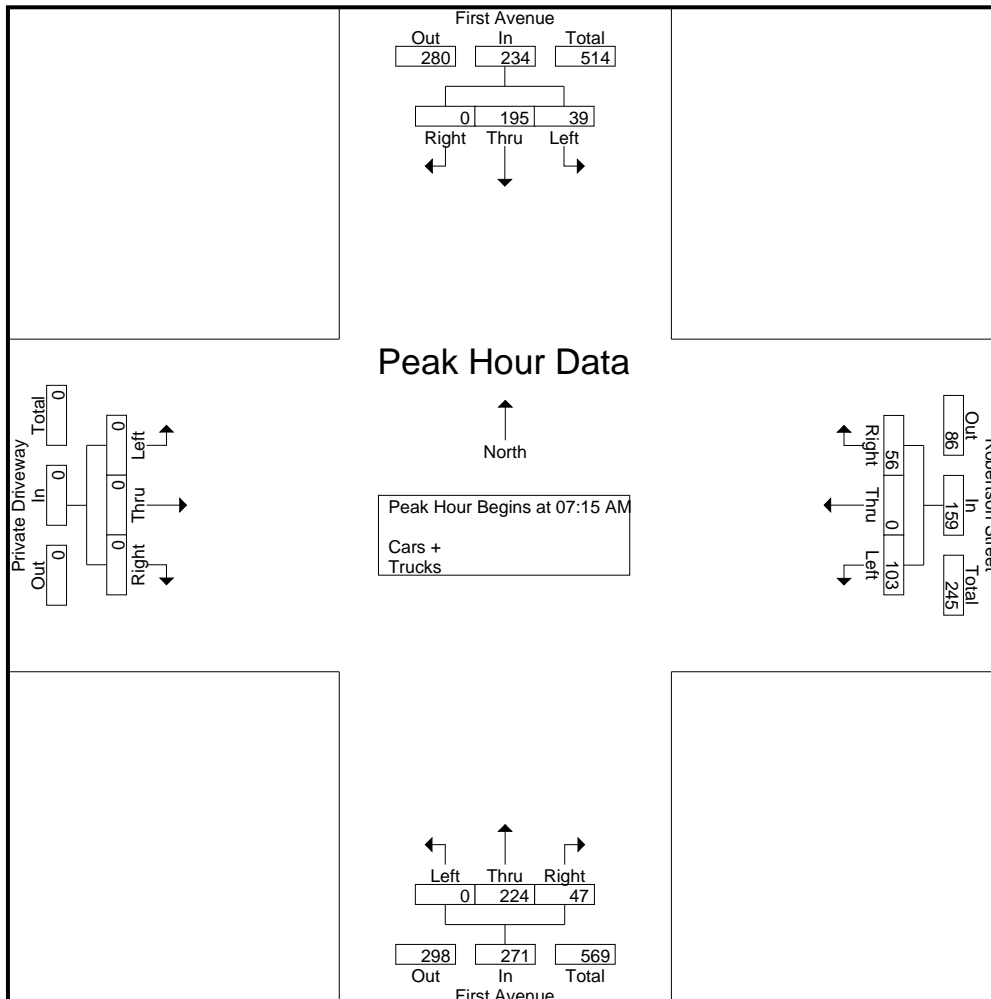
Start Time	First Avenue Southbound				Robertson Street Westbound				First Avenue Northbound				Private Driveway Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
07:00 AM	0	35	9	44	10	0	19	29	7	66	0	73	0	0	0	0	146
07:15 AM	0	44	13	57	7	0	20	27	11	60	0	71	0	0	0	0	155
07:30 AM	0	56	10	66	13	0	24	37	10	80	0	90	0	0	0	0	193
07:45 AM	0	54	11	65	18	0	25	43	14	41	0	55	0	0	0	0	163
Total	0	189	43	232	48	0	88	136	42	247	0	289	0	0	0	0	657
08:00 AM	0	41	5	46	18	0	34	52	12	43	0	55	0	0	0	0	153
08:15 AM	0	48	5	53	10	0	30	40	8	40	0	48	0	0	0	0	141
08:30 AM	0	42	9	51	8	0	14	22	13	27	0	40	0	0	0	0	113
08:45 AM	0	34	5	39	10	0	18	28	17	42	1	60	0	0	0	0	127
Total	0	165	24	189	46	0	96	142	50	152	1	203	0	0	0	0	534
Grand Total	0	354	67	421	94	0	184	278	92	399	1	492	0	0	0	0	1191
Apprch %	0	84.1	15.9		33.8	0	66.2		18.7	81.1	0.2		0	0	0		
Total %	0	29.7	5.6	35.3	7.9	0	15.4	23.3	7.7	33.5	0.1	41.3	0	0	0	0	
Cars +	0	346	66	412	94	0	184	278	91	392	1	484	0	0	0	0	1174
% Cars +	0	97.7	98.5	97.9	100	0	100	100	98.9	98.2	100	98.4	0	0	0	0	98.6
Trucks	0	8	1	9	0	0	0	0	1	7	0	8	0	0	0	0	17
% Trucks	0	2.3	1.5	2.1	0	0	0	0	1.1	1.8	0	1.6	0	0	0	0	1.4



TRAFFIC DATA COLLECTION

File Name : Knightdale(First and Robertson) AM Peak
 Site Code :
 Start Date : 12/16/2021
 Page No : 2

Start Time	First Avenue Southbound				Robertson Street Westbound				First Avenue Northbound				Private Driveway Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	44	13	57	7	0	20	27	11	60	0	71	0	0	0	0	155
07:30 AM	0	56	10	66	13	0	24	37	10	80	0	90	0	0	0	0	193
07:45 AM	0	54	11	65	18	0	25	43	14	41	0	55	0	0	0	0	163
08:00 AM	0	41	5	46	18	0	34	52	12	43	0	55	0	0	0	0	153
Total Volume	0	195	39	234	56	0	103	159	47	224	0	271	0	0	0	0	664
% App. Total	0	83.3	16.7		35.2	0	64.8		17.3	82.7	0		0	0	0		
PHF	.000	.871	.750	.886	.778	.000	.757	.764	.839	.700	.000	.753	.000	.000	.000	.000	.860





TRAFFIC DATA COLLECTION

File Name : Knightdale(First and Robertson) PM Peak
 Site Code :
 Start Date : 12/16/2021
 Page No : 1

Groups Printed- Cars + - Trucks

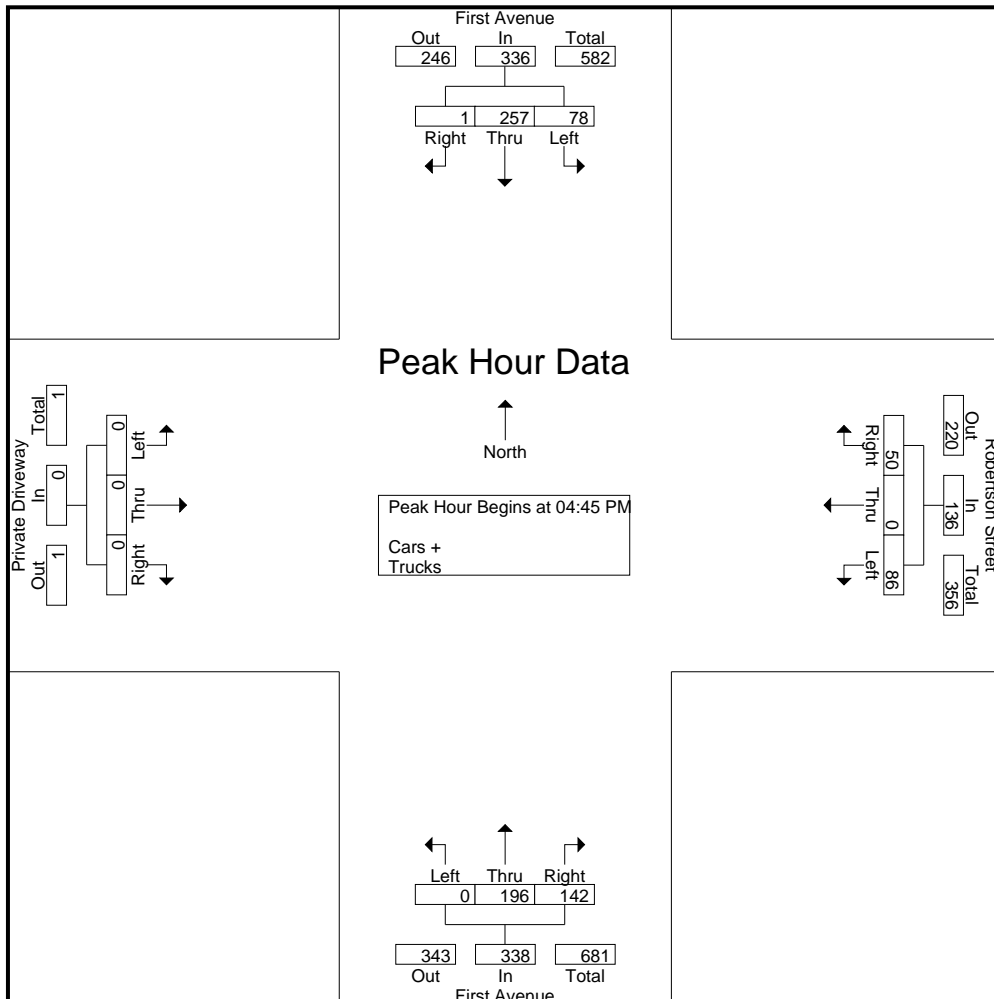
Start Time	First Avenue Southbound				Robertson Street Westbound				First Avenue Northbound				Private Driveway Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
04:00 PM	0	55	9	64	13	0	28	41	27	49	0	76	0	0	0	0	181
04:15 PM	0	51	15	66	15	0	19	34	25	58	0	83	0	0	0	0	183
04:30 PM	0	64	14	78	5	0	37	42	34	53	0	87	0	0	0	0	207
04:45 PM	0	59	25	84	15	0	20	35	32	54	0	86	0	0	0	0	205
Total	0	229	63	292	48	0	104	152	118	214	0	332	0	0	0	0	776
05:00 PM	0	53	16	69	10	0	20	30	52	40	0	92	0	0	0	0	191
05:15 PM	1	71	16	88	13	0	27	40	22	51	0	73	0	0	0	0	201
05:30 PM	0	74	21	95	12	0	19	31	36	51	0	87	0	0	0	0	213
05:45 PM	0	57	16	73	12	0	18	30	26	37	0	63	0	0	0	0	166
Total	1	255	69	325	47	0	84	131	136	179	0	315	0	0	0	0	771
Grand Total	1	484	132	617	95	0	188	283	254	393	0	647	0	0	0	0	1547
Apprch %	0.2	78.4	21.4		33.6	0	66.4		39.3	60.7	0		0	0	0		
Total %	0.1	31.3	8.5	39.9	6.1	0	12.2	18.3	16.4	25.4	0	41.8	0	0	0	0	
Cars +	1	483	132	616	95	0	188	283	253	389	0	642	0	0	0	0	1541
% Cars +	100	99.8	100	99.8	100	0	100	100	99.6	99	0	99.2	0	0	0	0	99.6
Trucks	0	1	0	1	0	0	0	0	1	4	0	5	0	0	0	0	6
% Trucks	0	0.2	0	0.2	0	0	0	0	0.4	1	0	0.8	0	0	0	0	0.4



TRAFFIC DATA COLLECTION

File Name : Knightdale(First and Robertson) PM Peak
 Site Code :
 Start Date : 12/16/2021
 Page No : 2

Start Time	First Avenue Southbound				Robertson Street Westbound				First Avenue Northbound				Private Driveway Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	59	25	84	15	0	20	35	32	54	0	86	0	0	0	0	205
05:00 PM	0	53	16	69	10	0	20	30	52	40	0	92	0	0	0	0	191
05:15 PM	1	71	16	88	13	0	27	40	22	51	0	73	0	0	0	0	201
05:30 PM	0	74	21	95	12	0	19	31	36	51	0	87	0	0	0	0	213
Total Volume	1	257	78	336	50	0	86	136	142	196	0	338	0	0	0	0	810
% App. Total	0.3	76.5	23.2		36.8	0	63.2		42	58	0		0	0	0		
PHF	.250	.868	.780	.884	.833	.000	.796	.850	.683	.907	.000	.918	.000	.000	.000	.000	.951





TRAFFIC DATA COLLECTION

File Name : Knightdale(First and Smithfield) AM Peak
 Site Code :
 Start Date : 12/16/2021
 Page No : 1

Groups Printed- Cars + - Trucks

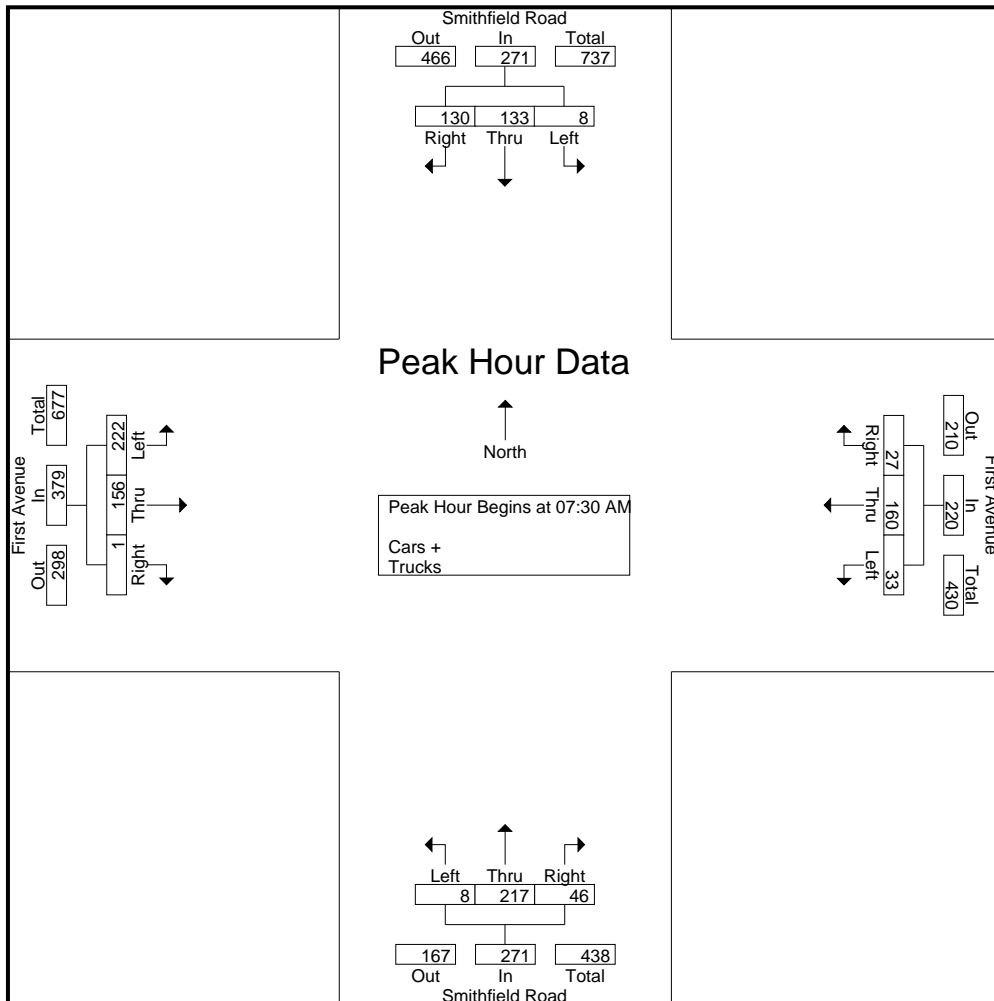
Start Time	Smithfield Road Southbound				First Avenue Westbound				Smithfield Road Northbound				First Avenue Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
07:00 AM	16	16	0	32	3	24	6	33	12	44	1	57	1	51	41	93	215
07:15 AM	23	35	1	59	7	35	5	47	12	37	1	50	0	50	48	98	254
07:30 AM	33	27	1	61	9	50	12	71	9	50	0	59	1	59	62	122	313
07:45 AM	38	27	3	68	6	40	5	51	19	75	3	97	0	32	63	95	311
Total	110	105	5	220	25	149	28	202	52	206	5	263	2	192	214	408	1093
08:00 AM	26	40	2	68	7	32	8	47	11	48	3	62	0	28	55	83	260
08:15 AM	33	39	2	74	5	38	8	51	7	44	2	53	0	37	42	79	257
08:30 AM	21	33	5	59	3	30	5	38	2	51	0	53	2	33	65	100	250
08:45 AM	32	39	3	74	14	30	3	47	4	82	3	89	4	49	54	107	317
Total	112	151	12	275	29	130	24	183	24	225	8	257	6	147	216	369	1084
Grand Total	222	256	17	495	54	279	52	385	76	431	13	520	8	339	430	777	2177
Apprch %	44.8	51.7	3.4		14	72.5	13.5		14.6	82.9	2.5		1	43.6	55.3		
Total %	10.2	11.8	0.8	22.7	2.5	12.8	2.4	17.7	3.5	19.8	0.6	23.9	0.4	15.6	19.8	35.7	
Cars +	220	242	17	479	53	277	52	382	75	416	11	502	8	337	427	772	2135
% Cars +	99.1	94.5	100	96.8	98.1	99.3	100	99.2	98.7	96.5	84.6	96.5	100	99.4	99.3	99.4	98.1
Trucks	2	14	0	16	1	2	0	3	1	15	2	18	0	2	3	5	42
% Trucks	0.9	5.5	0	3.2	1.9	0.7	0	0.8	1.3	3.5	15.4	3.5	0	0.6	0.7	0.6	1.9



TRAFFIC DATA COLLECTION

File Name : Knightdale(First and Smithfield) AM Peak
 Site Code :
 Start Date : 12/16/2021
 Page No : 2

Start Time	Smithfield Road Southbound				First Avenue Westbound				Smithfield Road Northbound				First Avenue Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	33	27	1	61	9	50	12	71	9	50	0	59	1	59	62	122	313
07:45 AM	38	27	3	68	6	40	5	51	19	75	3	97	0	32	63	95	311
08:00 AM	26	40	2	68	7	32	8	47	11	48	3	62	0	28	55	83	260
08:15 AM	33	39	2	74	5	38	8	51	7	44	2	53	0	37	42	79	257
Total Volume	130	133	8	271	27	160	33	220	46	217	8	271	1	156	222	379	1141
% App. Total	48	49.1	3		12.3	72.7	15		17	80.1	3		0.3	41.2	58.6		
PHF	.855	.831	.667	.916	.750	.800	.688	.775	.605	.723	.667	.698	.250	.661	.881	.777	.911





TRAFFIC DATA COLLECTION

File Name : Knightdale(First and Smithfield) PM Peak
 Site Code :
 Start Date : 12/16/2021
 Page No : 1

Groups Printed- Cars + - Trucks

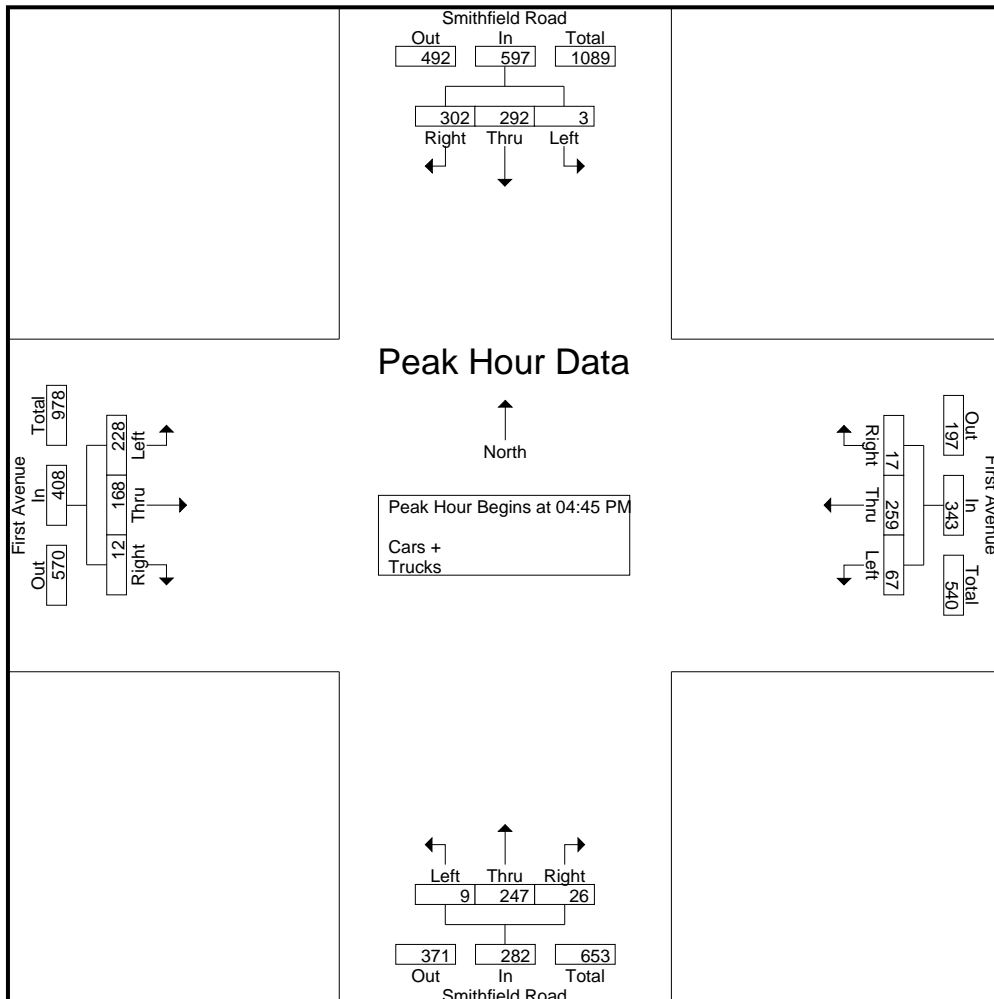
Start Time	Smithfield Road Southbound				First Avenue Westbound				Smithfield Road Northbound				First Avenue Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
04:00 PM	49	71	2	122	16	63	22	101	6	48	5	59	7	47	54	108	390
04:15 PM	68	80	1	149	6	48	14	68	6	74	4	84	4	43	62	109	410
04:30 PM	67	61	2	130	12	56	15	83	7	62	5	74	2	35	64	101	388
04:45 PM	73	64	1	138	7	60	15	82	4	68	3	75	4	46	70	120	415
Total	257	276	6	539	41	227	66	334	23	252	17	292	17	171	250	438	1603
05:00 PM	73	73	1	147	5	72	12	89	8	67	1	76	4	43	57	104	416
05:15 PM	78	77	0	155	0	72	19	91	6	55	0	61	2	40	57	99	406
05:30 PM	78	78	1	157	5	55	21	81	8	57	5	70	2	39	44	85	393
05:45 PM	69	68	0	137	8	56	16	80	3	55	4	62	2	36	65	103	382
Total	298	296	2	596	18	255	68	341	25	234	10	269	10	158	223	391	1597
Grand Total	555	572	8	1135	59	482	134	675	48	486	27	561	27	329	473	829	3200
Apprch %	48.9	50.4	0.7		8.7	71.4	19.9		8.6	86.6	4.8		3.3	39.7	57.1		
Total %	17.3	17.9	0.2	35.5	1.8	15.1	4.2	21.1	1.5	15.2	0.8	17.5	0.8	10.3	14.8	25.9	
Cars +	553	571	8	1132	59	481	134	674	48	486	27	561	27	327	473	827	3194
% Cars +	99.6	99.8	100	99.7	100	99.8	100	99.9	100	100	100	100	100	99.4	100	99.8	99.8
Trucks	2	1	0	3	0	1	0	1	0	0	0	0	0	2	0	2	6
% Trucks	0.4	0.2	0	0.3	0	0.2	0	0.1	0	0	0	0	0	0.6	0	0.2	0.2



TRAFFIC DATA COLLECTION

File Name : Knightdale(First and Smithfield) PM Peak
 Site Code :
 Start Date : 12/16/2021
 Page No : 2

Start Time	Smithfield Road Southbound				First Avenue Westbound				Smithfield Road Northbound				First Avenue Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	73	64	1	138	7	60	15	82	4	68	3	75	4	46	70	120	415
05:00 PM	73	73	1	147	5	72	12	89	8	67	1	76	4	43	57	104	416
05:15 PM	78	77	0	155	0	72	19	91	6	55	0	61	2	40	57	99	406
05:30 PM	78	78	1	157	5	55	21	81	8	57	5	70	2	39	44	85	393
Total Volume	302	292	3	597	17	259	67	343	26	247	9	282	12	168	228	408	1630
% App. Total	50.6	48.9	0.5		5	75.5	19.5		9.2	87.6	3.2		2.9	41.2	55.9		
PHF	.968	.936	.750	.951	.607	.899	.798	.942	.813	.908	.450	.928	.750	.913	.814	.850	.980





TRAFFIC DATA COLLECTION

File Name : Knightdale(Knightdale Station Run and Carolinian Ave)
 Site Code :
 Start Date : 5/12/2022
 Page No : 1

Groups Printed- Cars + - Trucks

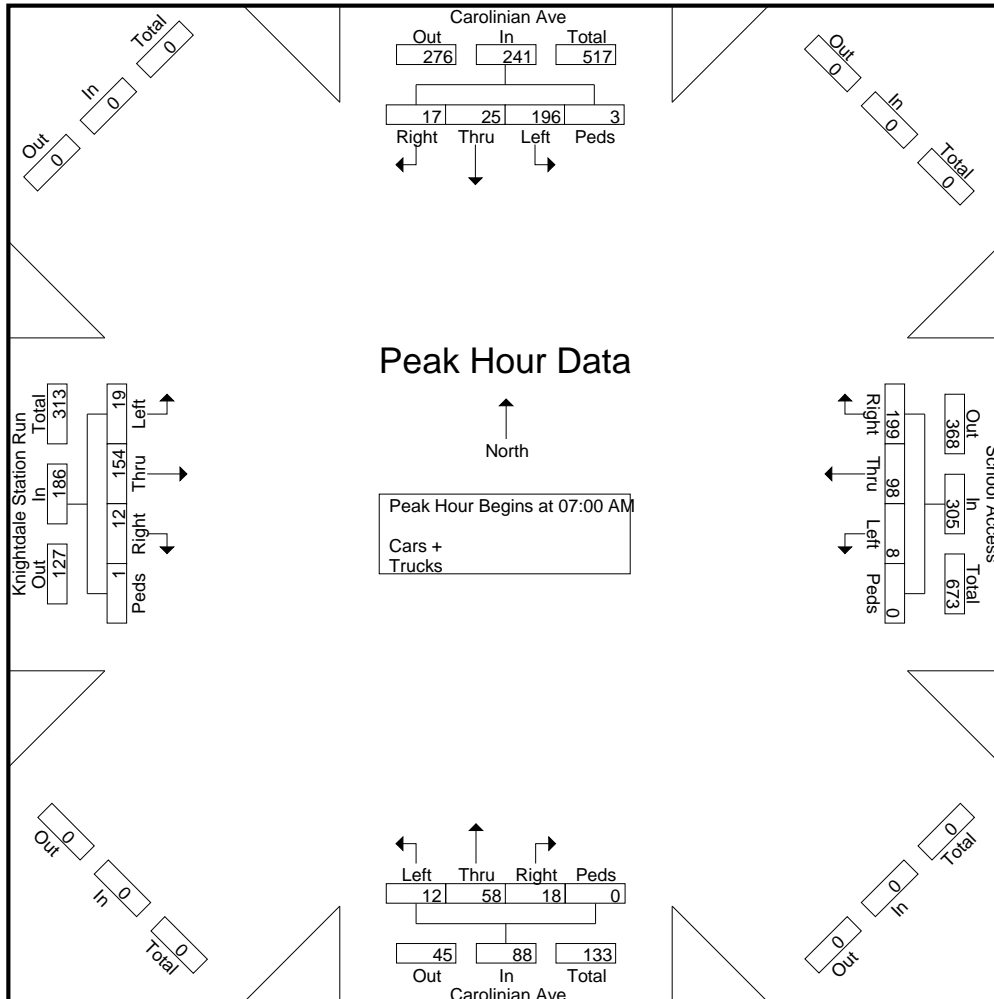
Start Time	Carolinian Ave Southbound					School Access Westbound					Carolinian Ave Northbound					Knightdale Station Run Eastbound					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
07:00 AM	1	10	24	0	35	2	1	0	0	3	0	10	4	0	14	3	20	4	0	27	79	
07:15 AM	7	3	73	2	85	51	25	0	0	76	5	16	1	0	22	2	52	3	0	57	240	
07:30 AM	2	7	88	1	98	93	45	2	0	140	11	17	3	0	31	5	69	6	1	81	350	
07:45 AM	7	5	11	0	23	53	27	6	0	86	2	15	4	0	21	2	13	6	0	21	151	
Total	17	25	196	3	241	199	98	8	0	305	18	58	12	0	88	12	154	19	1	186	820	
08:00 AM	3	3	2	0	8	3	2	0	0	5	0	13	4	0	17	3	1	8	0	12	42	
08:15 AM	2	8	1	0	11	1	0	1	0	2	1	6	2	0	9	8	0	4	0	12	34	
08:30 AM	8	8	2	0	18	3	0	0	0	3	0	12	5	0	17	1	0	3	0	4	42	
08:45 AM	4	9	1	0	14	1	0	0	0	1	0	12	12	0	24	3	0	5	0	8	47	
Total	17	28	6	0	51	8	2	1	0	11	1	43	23	0	67	15	1	20	0	36	165	
Grand Total	34	53	202	3	292	207	100	9	0	316	19	101	35	0	155	27	155	39	1	222	985	
Apprch %	11.6	18.2	69.2	1		65.5	31.6	2.8	0		12.3	65.2	22.6	0		12.2	69.8	17.6	0.5			
Total %	3.5	5.4	20.5	0.3	29.6	21	10.2	0.9	0	32.1	1.9	10.3	3.6	0	15.7	2.7	15.7	4	0.1	22.5		
Cars +	34	51	202	3	290	207	100	9	0	316	19	101	34	0	154	26	155	39	1	221	981	
% Cars +	100	96.2	100	100	99.3	100	100	100	0	100	100	100	97.1	0	99.4	96.3	100	100	100	99.5	99.6	
Trucks	0	2	0	0	2	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	1	4
% Trucks	0	3.8	0	0	0.7	0	0	0	0	0	0	0	2.9	0	0.6	3.7	0	0	0	0	0.5	0.4



TRAFFIC DATA COLLECTION

File Name : Knightdale(Knightdale Station Run and Carolinian Ave)
 Site Code :
 Start Date : 5/12/2022
 Page No : 2

Start Time	Carolinian Ave Southbound					School Access Westbound					Carolinian Ave Northbound					Knightdale Station Run Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	1	10	24	0	35	2	1	0	0	3	0	10	4	0	14	3	20	4	0	27	79
07:15 AM	7	3	73	2	85	51	25	0	0	76	5	16	1	0	22	2	52	3	0	57	240
07:30 AM	2	7	88	1	98	93	45	2	0	140	11	17	3	0	31	5	69	6	1	81	350
07:45 AM	7	5	11	0	23	53	27	6	0	86	2	15	4	0	21	2	13	6	0	21	151
Total Volume	17	25	196	3	241	199	98	8	0	305	18	58	12	0	88	12	154	19	1	186	820
% App. Total	7.1	10.4	81.3	1.2		65.2	32.1	2.6	0		20.5	65.9	13.6	0		6.5	82.8	10.2	0.5		
PHF	.607	.625	.557	.375	.615	.535	.544	.333	.000	.545	.409	.853	.750	.000	.710	.600	.558	.792	.250	.574	.586

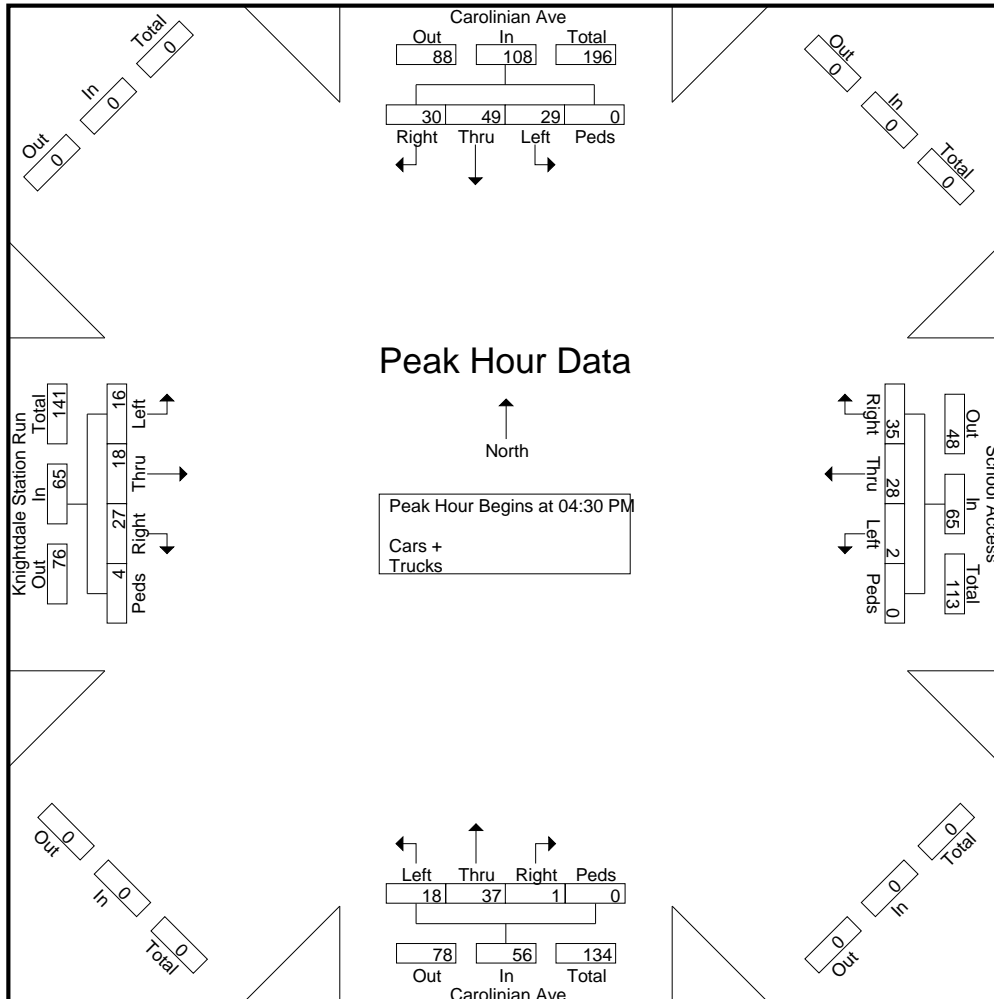




TRAFFIC DATA COLLECTION

File Name : Knightdale(Knightdale Station Run and Carolinian Ave)
 Site Code :
 Start Date : 5/12/2022
 Page No : 2

Start Time	Carolinian Ave Southbound					School Access Westbound					Carolinian Ave Northbound					Knightdale Station Run Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	5	10	7	0	22	12	14	1	0	27	0	7	5	0	12	9	5	4	4	22	83
04:45 PM	8	18	8	0	34	7	7	0	0	14	0	12	2	0	14	7	5	3	0	15	77
05:00 PM	6	9	5	0	20	9	3	0	0	12	0	8	4	0	12	4	4	4	0	12	56
05:15 PM	11	12	9	0	32	7	4	1	0	12	1	10	7	0	18	7	4	5	0	16	78
Total Volume	30	49	29	0	108	35	28	2	0	65	1	37	18	0	56	27	18	16	4	65	294
% App. Total	27.8	45.4	26.9	0		53.8	43.1	3.1	0		1.8	66.1	32.1	0		41.5	27.7	24.6	6.2		
PHF	.682	.681	.806	.000	.794	.729	.500	.500	.000	.602	.250	.771	.643	.000	.778	.750	.900	.800	.250	.739	.886





TRAFFIC DATA COLLECTION

File Name : Knightdale(Marshall and Marks Creek)AM
 Site Code :
 Start Date : 6/2/2022
 Page No : 1

Groups Printed- Cars + - Trucks

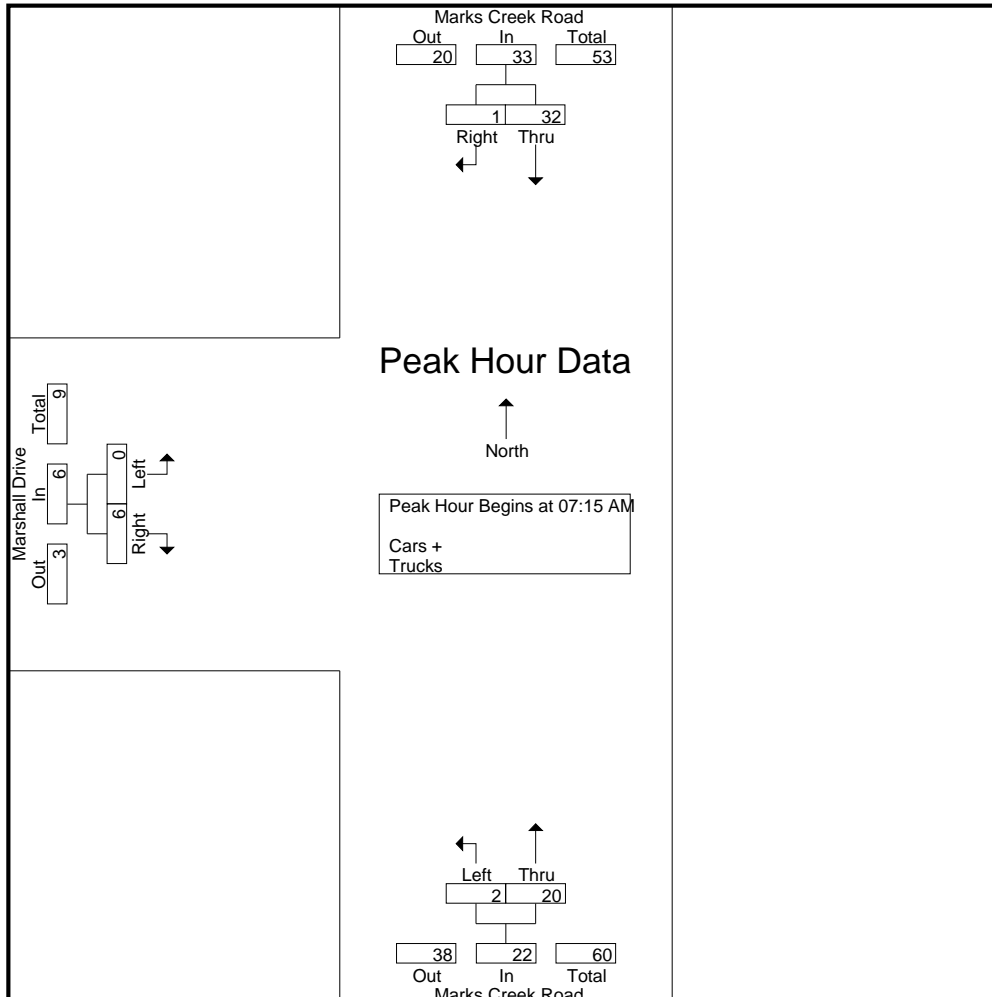
Start Time	Marks Creek Road Southbound			Marks Creek Road Northbound			Marshall Drive Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
07:00 AM	1	6	7	2	1	3	1	1	2	12
07:15 AM	0	7	7	7	0	7	1	0	1	15
07:30 AM	0	7	7	5	1	6	2	0	2	15
07:45 AM	0	10	10	6	0	6	1	0	1	17
Total	1	30	31	20	2	22	5	1	6	59
08:00 AM	1	8	9	2	1	3	2	0	2	14
08:15 AM	0	4	4	2	0	2	0	0	0	6
08:30 AM	0	7	7	4	0	4	2	0	2	13
08:45 AM	1	6	7	3	0	3	0	0	0	10
Total	2	25	27	11	1	12	4	0	4	43
Grand Total	3	55	58	31	3	34	9	1	10	102
Apprch %	5.2	94.8		91.2	8.8		90	10		
Total %	2.9	53.9	56.9	30.4	2.9	33.3	8.8	1	9.8	
Cars +	3	49	52	29	3	32	8	1	9	93
% Cars +	100	89.1	89.7	93.5	100	94.1	88.9	100	90	91.2
Trucks	0	6	6	2	0	2	1	0	1	9
% Trucks	0	10.9	10.3	6.5	0	5.9	11.1	0	10	8.8



TRAFFIC DATA COLLECTION

File Name : Knightdale(Marshall and Marks Creek)AM
 Site Code :
 Start Date : 6/2/2022
 Page No : 2

Start Time	Marks Creek Road Southbound			Marks Creek Road Northbound			Marshall Drive Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	7	7	7	0	7	1	0	1	15
07:30 AM	0	7	7	5	1	6	2	0	2	15
07:45 AM	0	10	10	6	0	6	1	0	1	17
08:00 AM	1	8	9	2	1	3	2	0	2	14
Total Volume	1	32	33	20	2	22	6	0	6	61
% App. Total	3	97		90.9	9.1		100	0		
PHF	.250	.800	.825	.714	.500	.786	.750	.000	.750	.897





TRAFFIC DATA COLLECTION

File Name : Knightdale(Marshall and Marks Creek)PM
 Site Code :
 Start Date : 6/1/2022
 Page No : 1

Groups Printed- Cars + - Trucks

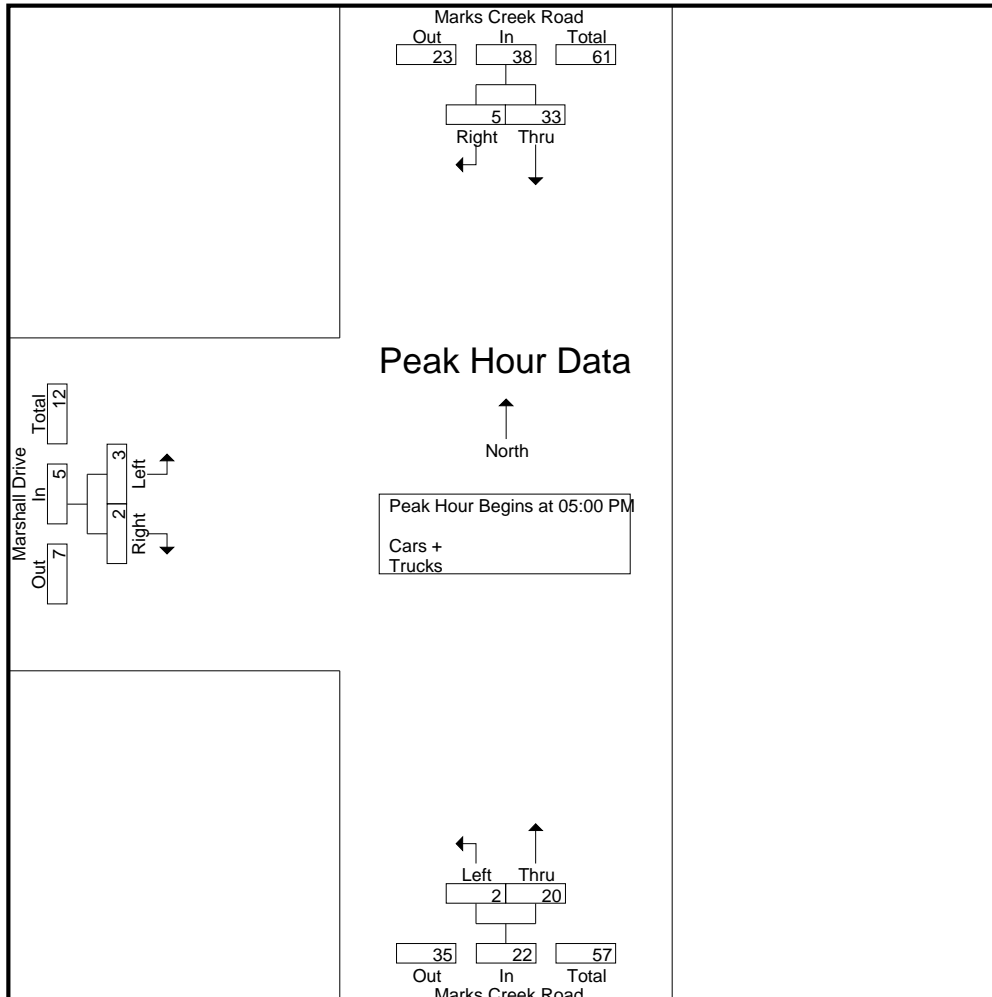
Start Time	Marks Creek Road Southbound			Marks Creek Road Northbound			Marshall Drive Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
04:00 PM	1	4	5	5	0	5	0	0	0	10
04:15 PM	0	5	5	3	1	4	1	0	1	10
04:30 PM	0	6	6	4	0	4	0	0	0	10
04:45 PM	1	7	8	6	0	6	0	0	0	14
Total	2	22	24	18	1	19	1	0	1	44
05:00 PM	0	8	8	2	0	2	0	1	1	11
05:15 PM	1	9	10	8	1	9	0	0	0	19
05:30 PM	1	11	12	5	1	6	0	1	1	19
05:45 PM	3	5	8	5	0	5	2	1	3	16
Total	5	33	38	20	2	22	2	3	5	65
Grand Total	7	55	62	38	3	41	3	3	6	109
Apprch %	11.3	88.7		92.7	7.3		50	50		
Total %	6.4	50.5	56.9	34.9	2.8	37.6	2.8	2.8	5.5	
Cars +	7	53	60	38	3	41	3	3	6	107
% Cars +	100	96.4	96.8	100	100	100	100	100	100	98.2
Trucks	0	2	2	0	0	0	0	0	0	2
% Trucks	0	3.6	3.2	0	0	0	0	0	0	1.8



TRAFFIC DATA COLLECTION

File Name : Knightdale(Marshall and Marks Creek)PM
 Site Code :
 Start Date : 6/1/2022
 Page No : 2

Start Time	Marks Creek Road Southbound			Marks Creek Road Northbound			Marshall Drive Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	8	8	2	0	2	0	1	1	11
05:15 PM	1	9	10	8	1	9	0	0	0	19
05:30 PM	1	11	12	5	1	6	0	1	1	19
05:45 PM	3	5	8	5	0	5	2	1	3	16
Total Volume	5	33	38	20	2	22	2	3	5	65
% App. Total	13.2	86.8		90.9	9.1		40	60		
PHF	.417	.750	.792	.625	.500	.611	.250	.750	.417	.855





TRAFFIC DATA COLLECTION

File Name : Knightdale (Robertson and Keith)
 Site Code :
 Start Date : 1/13/2022
 Page No : 1

Groups Printed- Cars + - Trucks

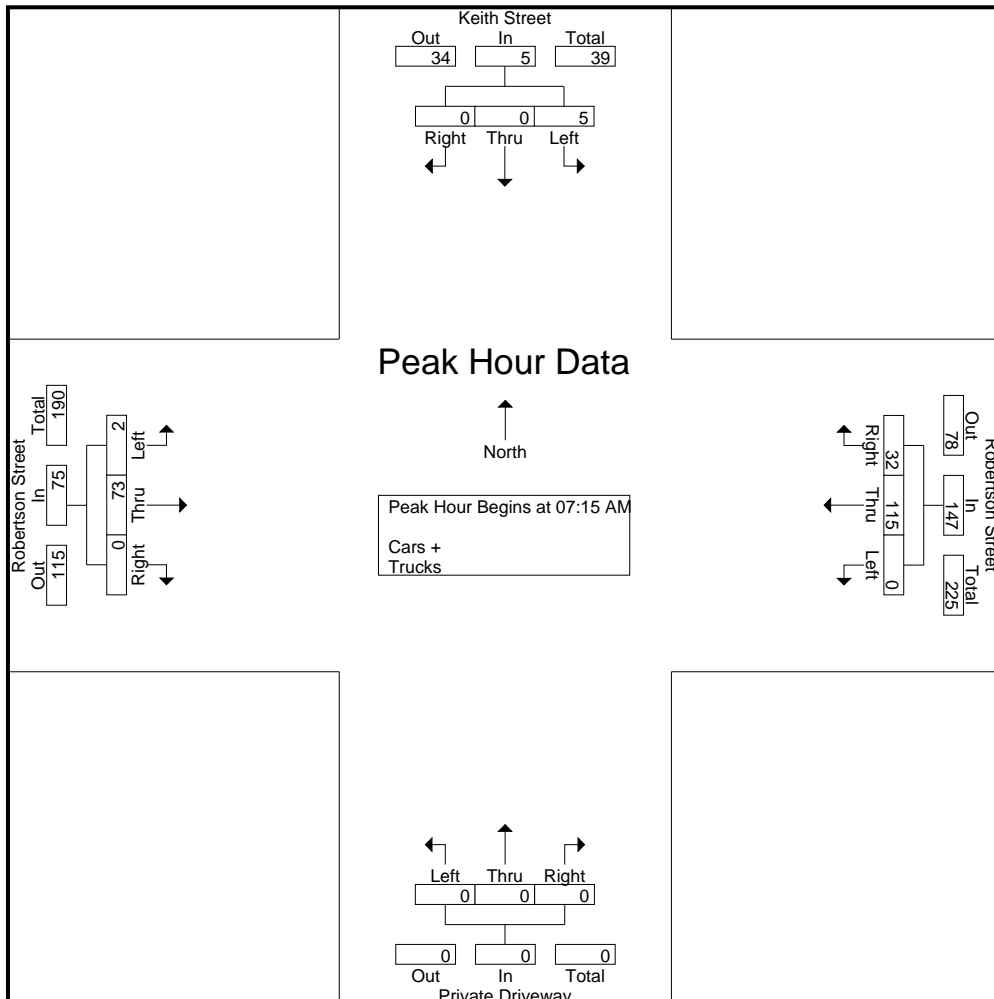
Start Time	Keith Street Southbound				Robertson Street Westbound				Private Driveway Northbound				Robertson Street Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
07:00 AM	1	0	2	3	8	16	0	24	0	0	0	0	0	12	0	12	39
07:15 AM	0	0	2	2	14	13	0	27	0	0	0	0	0	19	0	19	48
07:30 AM	0	0	0	0	11	36	0	47	0	0	0	0	0	20	1	21	68
07:45 AM	0	0	2	2	4	33	0	37	0	0	0	0	0	24	0	24	63
Total	1	0	6	7	37	98	0	135	0	0	0	0	0	75	1	76	218
08:00 AM	0	0	1	1	3	33	0	36	0	0	0	0	0	10	1	11	48
08:15 AM	1	0	0	1	2	25	0	27	0	0	0	0	0	10	1	11	39
08:30 AM	0	0	1	1	4	18	0	22	0	0	0	0	0	13	0	13	36
08:45 AM	0	0	1	1	4	24	0	28	0	0	0	0	0	13	0	13	42
Total	1	0	3	4	13	100	0	113	0	0	0	0	0	46	2	48	165
Grand Total	2	0	9	11	50	198	0	248	0	0	0	0	0	121	3	124	383
Apprch %	18.2	0	81.8		20.2	79.8	0		0	0	0	0	0	97.6	2.4		
Total %	0.5	0	2.3	2.9	13.1	51.7	0	64.8	0	0	0	0	0	31.6	0.8	32.4	
Cars +	2	0	9	11	49	195	0	244	0	0	0	0	0	119	3	122	377
% Cars +	100	0	100	100	98	98.5	0	98.4	0	0	0	0	0	98.3	100	98.4	98.4
Trucks	0	0	0	0	1	3	0	4	0	0	0	0	0	2	0	2	6
% Trucks	0	0	0	0	2	1.5	0	1.6	0	0	0	0	0	1.7	0	1.6	1.6



TRAFFIC DATA COLLECTION

File Name : Knightdale (Robertson and Keith)
 Site Code :
 Start Date : 1/13/2022
 Page No : 2

Start Time	Keith Street Southbound				Robertson Street Westbound				Private Driveway Northbound				Robertson Street Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	2	2	14	13	0	27	0	0	0	0	0	19	0	19	48
07:30 AM	0	0	0	0	11	36	0	47	0	0	0	0	0	20	1	21	68
07:45 AM	0	0	2	2	4	33	0	37	0	0	0	0	0	24	0	24	63
08:00 AM	0	0	1	1	3	33	0	36	0	0	0	0	0	10	1	11	48
Total Volume	0	0	5	5	32	115	0	147	0	0	0	0	0	73	2	75	227
% App. Total	0	0	100		21.8	78.2	0		0	0	0		0	97.3	2.7		
PHF	.000	.000	.625	.625	.571	.799	.000	.782	.000	.000	.000	.000	.000	.760	.500	.781	.835





TRAFFIC DATA COLLECTION

File Name : Knightdale (Robertson and Keith)
 Site Code :
 Start Date : 1/13/2022
 Page No : 1

Groups Printed- Cars + - Trucks

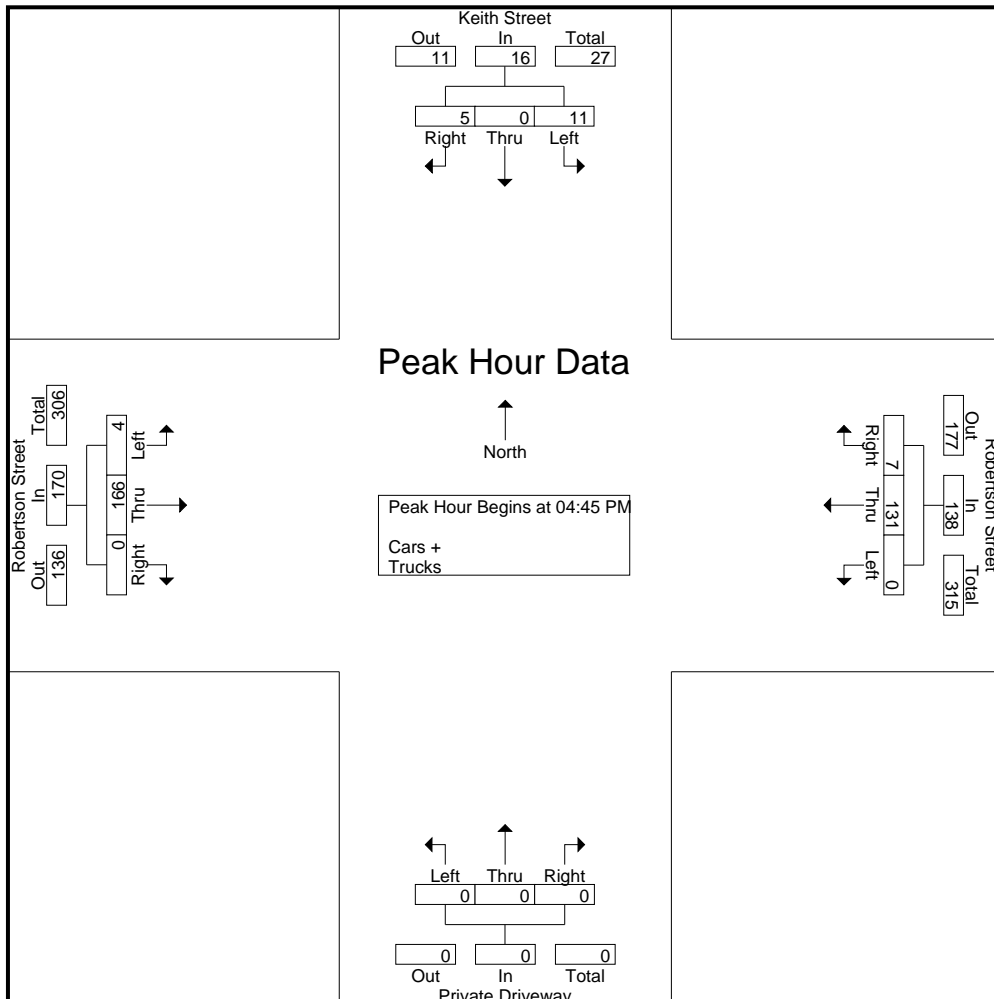
Start Time	Keith Street Southbound				Robertson Street Westbound				Private Driveway Northbound				Robertson Street Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
04:00 PM	1	0	4	5	1	24	0	25	0	0	0	0	0	27	1	28	58
04:15 PM	1	0	5	6	3	21	0	24	0	0	0	0	0	31	0	31	61
04:30 PM	0	0	2	2	2	22	0	24	0	0	1	1	0	36	2	38	65
04:45 PM	0	0	2	2	3	29	0	32	0	0	0	0	0	39	2	41	75
Total	2	0	13	15	9	96	0	105	0	0	1	1	0	133	5	138	259
05:00 PM	4	0	3	7	0	29	0	29	0	0	0	0	0	42	0	42	78
05:15 PM	0	0	0	0	1	36	0	37	0	0	0	0	0	48	1	49	86
05:30 PM	1	0	6	7	3	37	0	40	0	0	0	0	0	37	1	38	85
05:45 PM	0	0	3	3	6	21	0	27	0	0	0	0	0	33	1	34	64
Total	5	0	12	17	10	123	0	133	0	0	0	0	0	160	3	163	313
Grand Total	7	0	25	32	19	219	0	238	0	0	1	1	0	293	8	301	572
Apprch %	21.9	0	78.1		8	92	0		0	0	100		0	97.3	2.7		
Total %	1.2	0	4.4	5.6	3.3	38.3	0	41.6	0	0	0.2	0.2	0	51.2	1.4	52.6	
Cars +	7	0	24	31	19	216	0	235	0	0	1	1	0	289	8	297	564
% Cars +	100	0	96	96.9	100	98.6	0	98.7	0	0	100	100	0	98.6	100	98.7	98.6
Trucks	0	0	1	1	0	3	0	3	0	0	0	0	0	4	0	4	8
% Trucks	0	0	4	3.1	0	1.4	0	1.3	0	0	0	0	0	1.4	0	1.3	1.4



TRAFFIC DATA COLLECTION

File Name : Knightdale (Robertson and Keith)
 Site Code :
 Start Date : 1/13/2022
 Page No : 2

Start Time	Keith Street Southbound				Robertson Street Westbound				Private Driveway Northbound				Robertson Street Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	2	2	3	29	0	32	0	0	0	0	0	39	2	41	75
05:00 PM	4	0	3	7	0	29	0	29	0	0	0	0	0	42	0	42	78
05:15 PM	0	0	0	0	1	36	0	37	0	0	0	0	0	48	1	49	86
05:30 PM	1	0	6	7	3	37	0	40	0	0	0	0	0	37	1	38	85
Total Volume	5	0	11	16	7	131	0	138	0	0	0	0	0	166	4	170	324
% App. Total	31.2	0	68.8		5.1	94.9	0		0	0	0		0	97.6	2.4		
PHF	.313	.000	.458	.571	.583	.885	.000	.863	.000	.000	.000	.000	.000	.865	.500	.867	.942





TRAFFIC DATA COLLECTION

File Name : Knightdale(Robertson and Mailman)
 Site Code :
 Start Date : 1/13/2022
 Page No : 1

Groups Printed- Cars + - Trucks

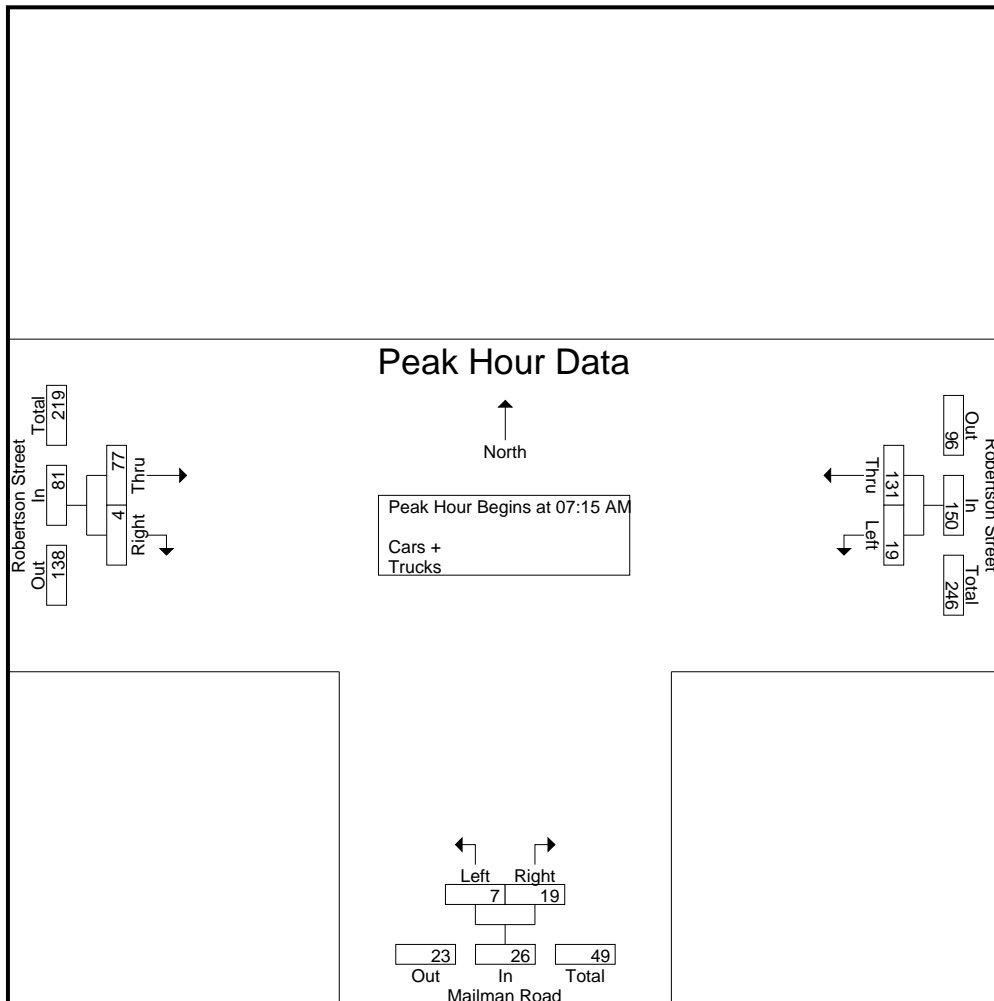
Start Time	Robertson Street Westbound			Mailman Road Northbound			Robertson Street Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
07:00 AM	15	1	16	3	3	6	1	11	12	34
07:15 AM	25	4	29	3	1	4	2	20	22	55
07:30 AM	39	4	43	5	1	6	0	20	20	69
07:45 AM	35	4	39	8	1	9	2	27	29	77
Total	114	13	127	19	6	25	5	78	83	235
08:00 AM	32	7	39	3	4	7	0	10	10	56
08:15 AM	26	5	31	4	0	4	0	13	13	48
08:30 AM	17	9	26	6	0	6	3	12	15	47
08:45 AM	22	1	23	5	2	7	0	14	14	44
Total	97	22	119	18	6	24	3	49	52	195
Grand Total	211	35	246	37	12	49	8	127	135	430
Apprch %	85.8	14.2		75.5	24.5		5.9	94.1		
Total %	49.1	8.1	57.2	8.6	2.8	11.4	1.9	29.5	31.4	
Cars +	210	32	242	35	11	46	8	127	135	423
% Cars +	99.5	91.4	98.4	94.6	91.7	93.9	100	100	100	98.4
Trucks	1	3	4	2	1	3	0	0	0	7
% Trucks	0.5	8.6	1.6	5.4	8.3	6.1	0	0	0	1.6



TRAFFIC DATA COLLECTION

File Name : Knightdale(Robertson and Mailman)
 Site Code :
 Start Date : 1/13/2022
 Page No : 2

Start Time	Robertson Street Westbound			Mailman Road Northbound			Robertson Street Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	25	4	29	3	1	4	2	20	22	55
07:30 AM	39	4	43	5	1	6	0	20	20	69
07:45 AM	35	4	39	8	1	9	2	27	29	77
08:00 AM	32	7	39	3	4	7	0	10	10	56
Total Volume	131	19	150	19	7	26	4	77	81	257
% App. Total	87.3	12.7		73.1	26.9		4.9	95.1		
PHF	.840	.679	.872	.594	.438	.722	.500	.713	.698	.834





TRAFFIC DATA COLLECTION

File Name : Knightdale(Robertson and Mailman)
 Site Code :
 Start Date : 1/13/2022
 Page No : 1

Groups Printed- Cars + - Trucks

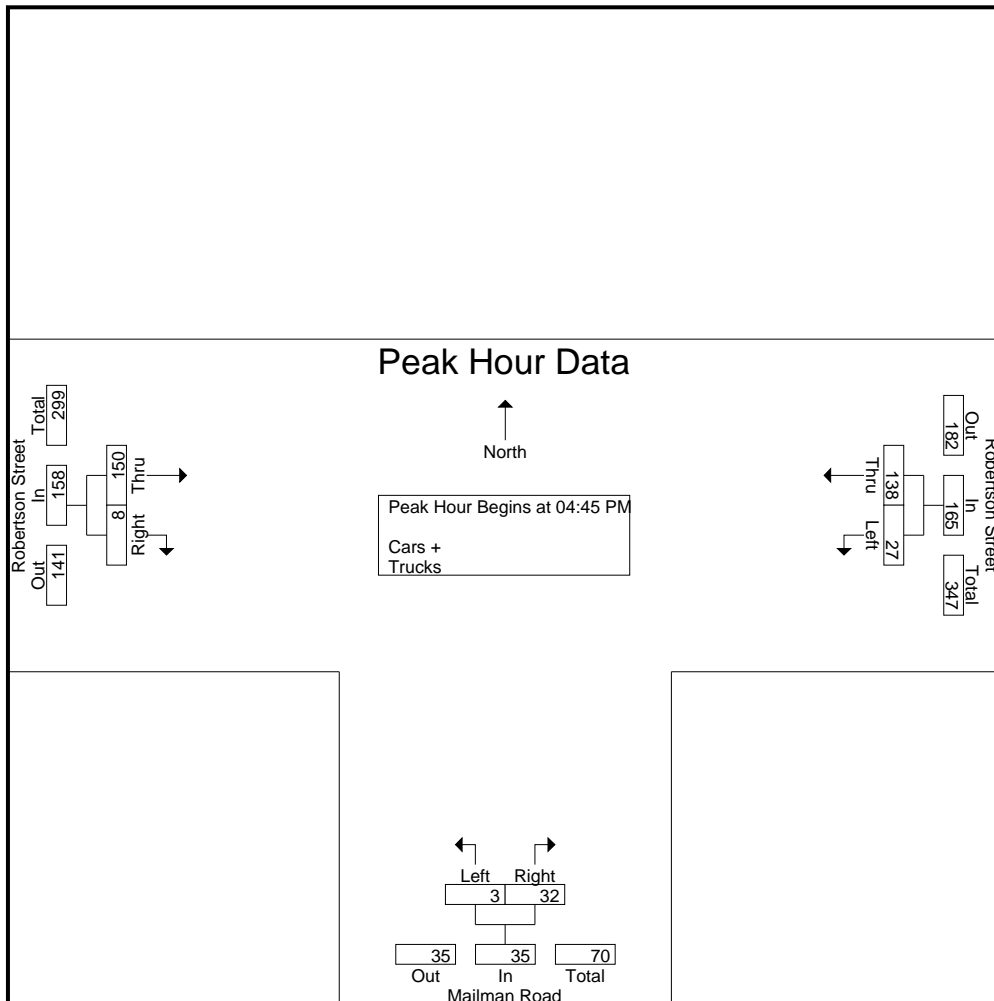
Start Time	Robertson Street Westbound			Mailman Road Northbound			Robertson Street Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
04:00 PM	19	12	31	4	3	7	3	28	31	69
04:15 PM	24	4	28	8	0	8	1	33	34	70
04:30 PM	27	6	33	8	0	8	2	39	41	82
04:45 PM	35	4	39	5	1	6	1	28	29	74
Total	105	26	131	25	4	29	7	128	135	295
05:00 PM	36	8	44	7	0	7	1	38	39	90
05:15 PM	31	7	38	10	2	12	2	50	52	102
05:30 PM	36	8	44	10	0	10	4	34	38	92
05:45 PM	23	7	30	6	1	7	2	32	34	71
Total	126	30	156	33	3	36	9	154	163	355
Grand Total	231	56	287	58	7	65	16	282	298	650
Apprch %	80.5	19.5		89.2	10.8		5.4	94.6		
Total %	35.5	8.6	44.2	8.9	1.1	10	2.5	43.4	45.8	
Cars +	231	54	285	56	7	63	15	279	294	642
% Cars +	100	96.4	99.3	96.6	100	96.9	93.8	98.9	98.7	98.8
Trucks	0	2	2	2	0	2	1	3	4	8
% Trucks	0	3.6	0.7	3.4	0	3.1	6.2	1.1	1.3	1.2



TRAFFIC DATA COLLECTION

File Name : Knightdale(Robertson and Mailman)
 Site Code :
 Start Date : 1/13/2022
 Page No : 2

Start Time	Robertson Street Westbound			Mailman Road Northbound			Robertson Street Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	35	4	39	5	1	6	1	28	29	74
05:00 PM	36	8	44	7	0	7	1	38	39	90
05:15 PM	31	7	38	10	2	12	2	50	52	102
05:30 PM	36	8	44	10	0	10	4	34	38	92
Total Volume	138	27	165	32	3	35	8	150	158	358
% App. Total	83.6	16.4		91.4	8.6		5.1	94.9		
PHF	.958	.844	.938	.800	.375	.729	.500	.750	.760	.877





TRAFFIC DATA COLLECTION

File Name : Knightdale(Robertson and Marks Creek)
 Site Code :
 Start Date : 1/19/2022
 Page No : 1

Groups Printed- Cars + - Trucks

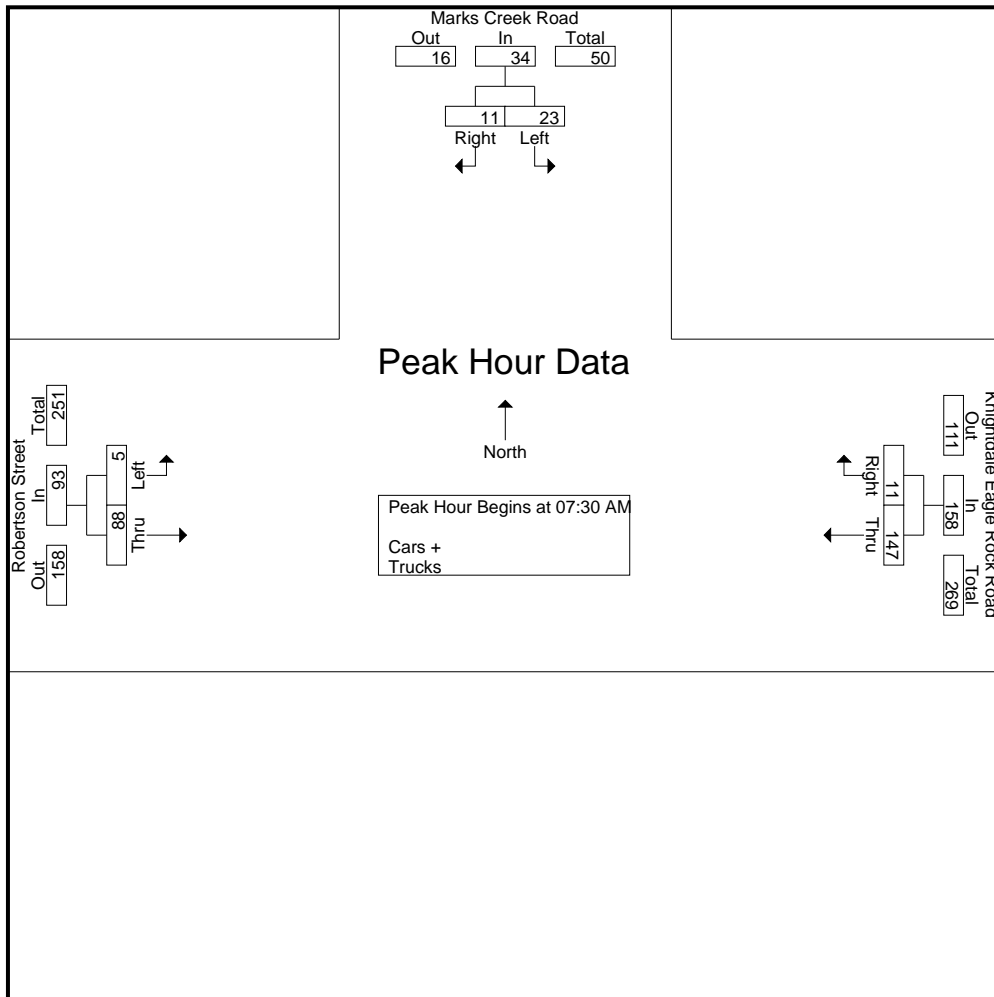
Start Time	Marks Creek Road Southbound			Knightdale Eagle Rock Road Westbound			Robertson Street Eastbound			Int. Total
	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	
07:00 AM	2	2	4	0	16	16	15	0	15	35
07:15 AM	3	6	9	0	27	27	20	0	20	56
07:30 AM	2	8	10	1	44	45	28	2	30	85
07:45 AM	3	5	8	3	36	39	33	1	34	81
Total	10	21	31	4	123	127	96	3	99	257
08:00 AM	3	4	7	4	38	42	12	1	13	62
08:15 AM	3	6	9	3	29	32	15	1	16	57
08:30 AM	5	1	6	0	23	23	18	3	21	50
08:45 AM	3	9	12	2	22	24	18	1	19	55
Total	14	20	34	9	112	121	63	6	69	224
Grand Total	24	41	65	13	235	248	159	9	168	481
Apprch %	36.9	63.1		5.2	94.8		94.6	5.4		
Total %	5	8.5	13.5	2.7	48.9	51.6	33.1	1.9	34.9	
Cars +	19	37	56	12	229	241	151	9	160	457
% Cars +	79.2	90.2	86.2	92.3	97.4	97.2	95	100	95.2	95
Trucks	5	4	9	1	6	7	8	0	8	24
% Trucks	20.8	9.8	13.8	7.7	2.6	2.8	5	0	4.8	5



TRAFFIC DATA COLLECTION

File Name : Knightdale(Robertson and Marks Creek)
 Site Code :
 Start Date : 1/19/2022
 Page No : 2

Start Time	Marks Creek Road Southbound			Knightdale Eagle Rock Road Westbound			Robertson Street Eastbound			Int. Total
	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	2	8	10	1	44	45	28	2	30	85
07:45 AM	3	5	8	3	36	39	33	1	34	81
08:00 AM	3	4	7	4	38	42	12	1	13	62
08:15 AM	3	6	9	3	29	32	15	1	16	57
Total Volume	11	23	34	11	147	158	88	5	93	285
% App. Total	32.4	67.6		7	93		94.6	5.4		
PHF	.917	.719	.850	.688	.835	.878	.667	.625	.684	.838





TRAFFIC DATA COLLECTION

File Name : Knightdale(Robertson and Marks Creek)
 Site Code :
 Start Date : 1/19/2022
 Page No : 1

Groups Printed- Cars + - Trucks

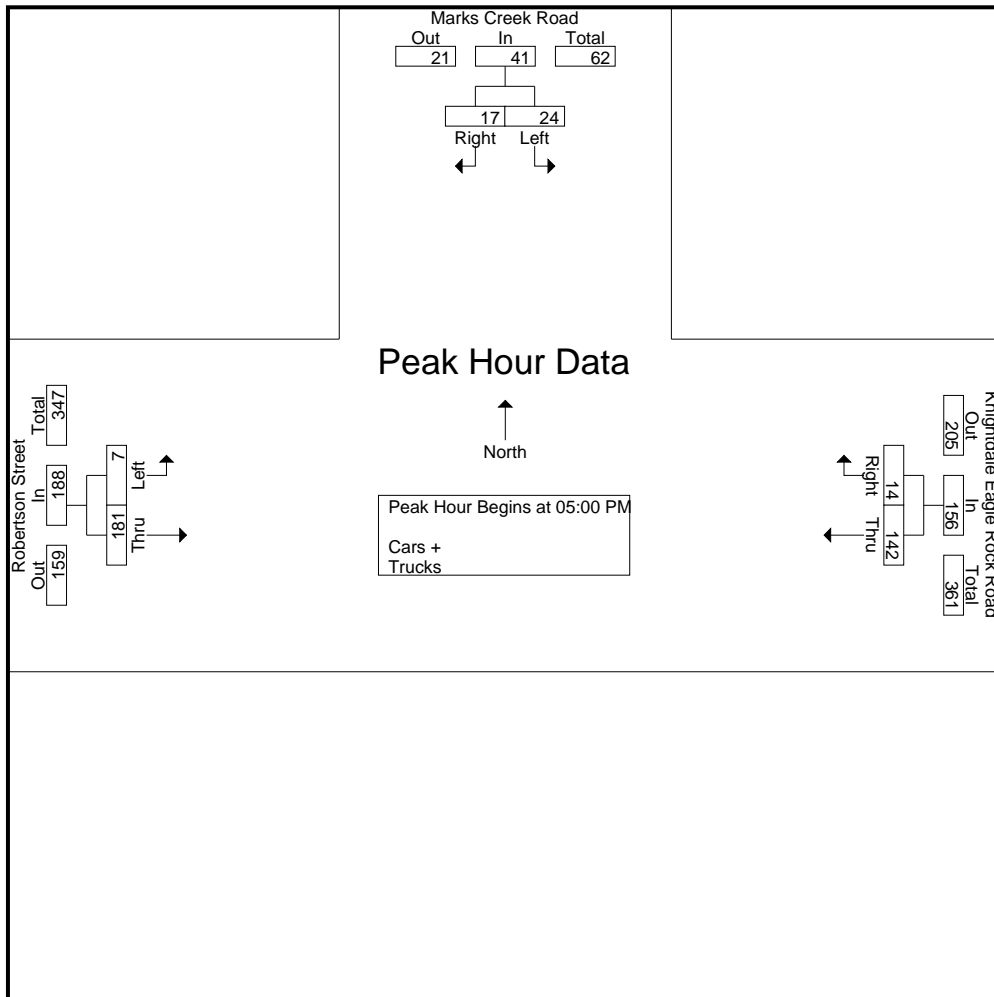
Start Time	Marks Creek Road Southbound			Knightdale Eagle Rock Road Westbound			Robertson Street Eastbound			Int. Total
	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	
04:00 PM	2	3	5	2	29	31	36	2	38	74
04:15 PM	5	8	13	9	22	31	34	4	38	82
04:30 PM	1	4	5	2	32	34	43	3	46	85
04:45 PM	5	1	6	2	31	33	37	2	39	78
Total	13	16	29	15	114	129	150	11	161	319
05:00 PM	4	2	6	2	40	42	41	2	43	91
05:15 PM	3	8	11	3	37	40	58	2	60	111
05:30 PM	6	8	14	3	37	40	44	2	46	100
05:45 PM	4	6	10	6	28	34	38	1	39	83
Total	17	24	41	14	142	156	181	7	188	385
Grand Total	30	40	70	29	256	285	331	18	349	704
Apprch %	42.9	57.1		10.2	89.8		94.8	5.2		
Total %	4.3	5.7	9.9	4.1	36.4	40.5	47	2.6	49.6	
Cars +	28	39	67	27	248	275	324	18	342	684
% Cars +	93.3	97.5	95.7	93.1	96.9	96.5	97.9	100	98	97.2
Trucks	2	1	3	2	8	10	7	0	7	20
% Trucks	6.7	2.5	4.3	6.9	3.1	3.5	2.1	0	2	2.8



TRAFFIC DATA COLLECTION

File Name : Knightdale(Robertson and Marks Creek)
 Site Code :
 Start Date : 1/19/2022
 Page No : 2

Start Time	Marks Creek Road Southbound			Knightdale Eagle Rock Road Westbound			Robertson Street Eastbound			Int. Total
	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	4	2	6	2	40	42	41	2	43	91
05:15 PM	3	8	11	3	37	40	58	2	60	111
05:30 PM	6	8	14	3	37	40	44	2	46	100
05:45 PM	4	6	10	6	28	34	38	1	39	83
Total Volume	17	24	41	14	142	156	181	7	188	385
% App. Total	41.5	58.5		9	91		96.3	3.7		
PHF	.708	.750	.732	.583	.888	.929	.780	.875	.783	.867



Appendix C – Traffic Signal Plans

Appendix D
Synchro and SIDRA Analysis Output

Existing Traffic Volumes

Robertson Street Assemblage TIA
1: Carolinian Ave & Knightdale Blvd

10/06/2022



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	11	564	130	105	1020	241	103
Future Volume (vph)	11	564	130	105	1020	241	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			3%	-1%	
Storage Length (ft)	250		225	275		275	275
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Fr _t			0.850				0.850
Fl _t Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1787	3575	1599	1743	3486	3450	1591
Fl _t Permitted	0.208			0.360		0.950	
Satd. Flow (perm)	391	3575	1599	661	3486	3450	1591
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	25	
Link Distance (ft)		948			1123	1095	
Travel Time (s)		14.4			17.0	29.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	12	627	144	117	1133	268	114
Shared Lane Traffic (%)							
Lane Group Flow (vph)	12	627	144	117	1133	268	114
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		12			12	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	0.99	1.02	1.02	0.99	0.99
Turning Speed (mph)	9		9	15		15	9
Turn Type	D.Pm	NA	pm+ov	D,P+P	NA	Prot	pm+ov
Protected Phases		2	8	1	6	8	1
Permitted Phases	6		2	2			8
Detector Phase	6	2	8	1	6	8	1
Switch Phase							
Minimum Initial (s)	12.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	25.0	32.1	25.0	14.0	25.0	25.0	14.0
Total Split (s)	61.0	45.0	29.0	16.0	61.0	29.0	16.0
Total Split (%)	67.8%	50.0%	32.2%	17.8%	67.8%	32.2%	17.8%
Maximum Green (s)	53.9	37.9	22.1	9.3	53.9	22.1	9.3
Yellow Time (s)	4.7	4.7	3.0	3.0	4.7	3.0	3.0
All-Red Time (s)	2.4	2.4	3.9	3.7	2.4	3.9	3.7
Lost Time Adjust (s)	-2.1	-2.1	-1.9	-1.7	-2.1	-1.9	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lag		Lead			Lead
Lead-Lag Optimize?		Yes		Yes			Yes
Vehicle Extension (s)	6.0	6.0	2.0	2.0	6.0	2.0	2.0
Minimum Gap (s)	3.0	3.0	2.0	2.0	3.0	2.0	2.0

Robertson Street Assemblage TIA
 1: Carolinian Ave & Knightdale Blvd

10/06/2022

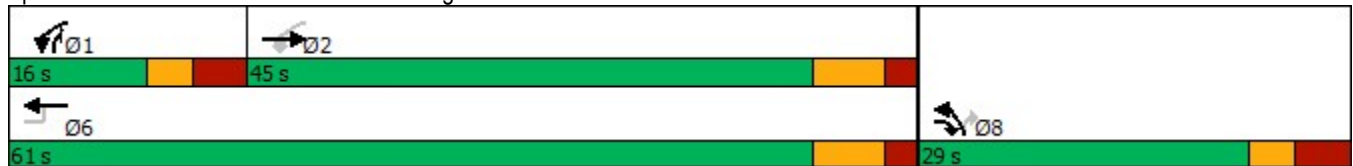


Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Time Before Reduce (s)	20.0	20.0	0.0	0.0	20.0	0.0	0.0
Time To Reduce (s)	45.0	45.0	0.0	0.0	45.0	0.0	0.0
Recall Mode	Min	Min	None	None	Min	None	None
Walk Time (s)		7.0					
Flash Dont Walk (s)		18.0					
Pedestrian Calls (#/hr)		0					
Act Effct Green (s)	29.6	19.1	36.4	25.8	29.6	10.8	25.1
Actuated g/C Ratio	0.58	0.38	0.72	0.51	0.58	0.21	0.49
v/c Ratio	0.05	0.47	0.13	0.22	0.56	0.36	0.15
Control Delay	5.2	14.6	3.9	6.0	7.6	20.2	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	14.6	3.9	6.0	7.6	20.2	9.6
LOS	A	B	A	A	A	C	A
Approach Delay		12.5			7.5	17.0	
Approach LOS		B			A	B	
Queue Length 50th (ft)	1	77	14	13	88	36	18
Queue Length 95th (ft)	7	131	30	32	151	75	52
Internal Link Dist (ft)		868			1043	1015	
Turn Bay Length (ft)	250		225	275		275	275
Base Capacity (vph)	382	2858	1455	598	3405	1680	856
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.22	0.10	0.20	0.33	0.16	0.13

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 50.8
 Natural Cycle: 75
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 10.6
 Intersection LOS: B
 Intersection Capacity Utilization 57.6%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 1: Carolinian Ave & Knightdale Blvd



Robertson Street Assemblage TIA
 2: Carolinian Ave & Knightdale Station Run

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	19	154	12	8	98	199	12	58	18	196	25	17
Future Volume (vph)	19	154	12	8	98	199	12	58	18	196	25	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.991			0.912			0.972			0.990	
Fl _t Protected		0.995			0.999			0.993			0.960	
Satd. Flow (prot)	0	1837	0	0	1697	0	0	1798	0	0	1770	0
Fl _t Permitted		0.995			0.999			0.993			0.960	
Satd. Flow (perm)	0	1837	0	0	1697	0	0	1798	0	0	1770	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		910			556			1007			1095	
Travel Time (s)		24.8			15.2			27.5			29.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	21	171	13	9	109	221	13	64	20	218	28	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	205	0	0	339	0	0	97	0	0	265	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	45.7%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 3: First Ave & Knightdale Station Run

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	97	26	282	136	26	189
Future Volume (vph)	97	26	282	136	26	189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.956			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1781	0	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1781	0	1770	1863
Link Speed (mph)	25		35			35
Link Distance (ft)	1463		1498			771
Travel Time (s)	39.9		29.2			15.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	108	29	313	151	29	210
Shared Lane Traffic (%)						
Lane Group Flow (vph)	108	29	464	0	29	210
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.2%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
3: First Ave & Knightdale Station Run

10/06/2022

Intersection						
Int Delay, s/veh	2.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖		↖	↗
Traffic Vol, veh/h	97	26	282	136	26	189
Future Vol, veh/h	97	26	282	136	26	189
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	108	29	313	151	29	210

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	657	389	0	0	464
Stage 1	389	-	-	-	-
Stage 2	268	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	430	659	-	-	1097
Stage 1	685	-	-	-	-
Stage 2	777	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	419	659	-	-	1097
Mov Cap-2 Maneuver	419	-	-	-	-
Stage 1	685	-	-	-	-
Stage 2	757	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.3	0	1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	419	659	1097	-
HCM Lane V/C Ratio	-	-	0.257	0.044	0.026	-
HCM Control Delay (s)	-	-	16.5	10.7	8.4	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	1	0.1	0.1	-

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	5	23	4	4	27	4	16	4	4	4	4	14
Future Volume (vph)	5	23	4	4	27	4	16	4	4	4	4	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.985			0.986			0.979			0.910	
Fl _t Protected		0.992			0.995			0.967			0.992	
Satd. Flow (prot)	0	1820	0	0	1827	0	0	1763	0	0	1682	0
Fl _t Permitted		0.992			0.995			0.967			0.992	
Satd. Flow (perm)	0	1820	0	0	1827	0	0	1763	0	0	1682	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1007			1193			1169			1254	
Travel Time (s)		27.5			32.5			31.9			34.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	26	4	4	30	4	18	4	4	4	4	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	0	0	38	0	0	26	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	13.8%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	23	4	4	27	4	16	4	4	4	4	14
Future Vol, veh/h	5	23	4	4	27	4	16	4	4	4	4	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	26	4	4	30	4	18	4	4	4	4	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	34	0	0	30	0	0	90	82	28	84	82	32
Stage 1	-	-	-	-	-	-	40	40	-	40	40	-
Stage 2	-	-	-	-	-	-	50	42	-	44	42	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1578	-	-	1583	-	-	895	808	1047	903	808	1042
Stage 1	-	-	-	-	-	-	975	862	-	975	862	-
Stage 2	-	-	-	-	-	-	963	860	-	970	860	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1578	-	-	1583	-	-	874	802	1047	890	802	1042
Mov Cap-2 Maneuver	-	-	-	-	-	-	874	802	-	890	802	-
Stage 1	-	-	-	-	-	-	971	859	-	971	859	-
Stage 2	-	-	-	-	-	-	941	857	-	957	857	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.1			0.8			9.2			8.8		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	885	1578	-	-	1583	-	-	960
HCM Lane V/C Ratio	0.03	0.004	-	-	0.003	-	-	0.025
HCM Control Delay (s)	9.2	7.3	0	-	7.3	0	-	8.8
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	4	6	4	20	32	4
Future Volume (vph)	4	6	4	20	32	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.914			0.986		
Flt Protected	0.982			0.992		
Satd. Flow (prot)	1672	0	0	1848	1837	0
Flt Permitted	0.982			0.992		
Satd. Flow (perm)	1672	0	0	1848	1837	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	997			2466	1085	
Travel Time (s)	27.2			37.4	16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	7	4	22	36	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	0	0	26	40	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.5%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	6	4	20	32	4
Future Vol, veh/h	4	6	4	20	32	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	7	4	22	36	4

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	68	38	40	0	0
Stage 1	38	-	-	-	-
Stage 2	30	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	937	1034	1570	-	-
Stage 1	984	-	-	-	-
Stage 2	993	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	934	1034	1570	-	-
Mov Cap-2 Maneuver	934	-	-	-	-
Stage 1	981	-	-	-	-
Stage 2	993	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1570	-	992	-	-
HCM Lane V/C Ratio	0.003	-	0.011	-	-
HCM Control Delay (s)	7.3	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	40	307	4	6	262
Future Volume (vph)	4	40	307	4	6	262
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.876		0.998			
Flt Protected	0.996					0.999
Satd. Flow (prot)	1625	0	1859	0	0	1861
Flt Permitted	0.996					0.999
Satd. Flow (perm)	1625	0	1859	0	0	1861
Link Speed (mph)	15		35			35
Link Distance (ft)	1616		1292			1498
Travel Time (s)	73.5		25.2			29.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	44	341	4	7	291
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	0	345	0	0	298
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.6%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
6: First Ave & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	T
Traffic Vol, veh/h	4	40	307	4	6	262
Future Vol, veh/h	4	40	307	4	6	262
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	44	341	4	7	291

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	648	343	0	0	345
Stage 1	343	-	-	-	-
Stage 2	305	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	435	700	-	-	1214
Stage 1	719	-	-	-	-
Stage 2	748	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	432	700	-	-	1214
Mov Cap-2 Maneuver	432	-	-	-	-
Stage 1	719	-	-	-	-
Stage 2	743	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	663	1214
HCM Lane V/C Ratio	-	-	0.074	0.005
HCM Control Delay (s)	-	-	10.9	8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Robertson Street Assemblage TIA
7: First Ave & Robertson St

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	103	56	224	47	39	195
Future Volume (vph)	103	56	224	47	39	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.952		0.977			
Flt Protected	0.969					0.992
Satd. Flow (prot)	1718	0	1820	0	0	1848
Flt Permitted	0.969					0.992
Satd. Flow (perm)	1718	0	1820	0	0	1848
Link Speed (mph)	25		35			35
Link Distance (ft)	1195		1409			1292
Travel Time (s)	32.6		27.4			25.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	114	62	249	52	43	217
Shared Lane Traffic (%)						
Lane Group Flow (vph)	176	0	301	0	0	260
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.2%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
7: First Ave & Robertson St

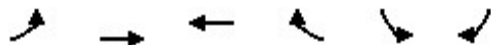
10/06/2022

Intersection						
Int Delay, s/veh	4.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	S	S
Traffic Vol, veh/h	103	56	224	47	39	195
Future Vol, veh/h	103	56	224	47	39	195
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	114	62	249	52	43	217

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	578	275	0	0	301
Stage 1	275	-	-	-	-
Stage 2	303	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	478	764	-	-	1260
Stage 1	771	-	-	-	-
Stage 2	749	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	459	764	-	-	1260
Mov Cap-2 Maneuver	459	-	-	-	-
Stage 1	771	-	-	-	-
Stage 2	720	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15	0	1.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	534	1260
HCM Lane V/C Ratio	-	-	0.331	0.034
HCM Control Delay (s)	-	-	15	8
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	1.4	0.1



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	4	73	115	32	5	4
Future Volume (vph)	4	73	115	32	5	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.970		0.946	
Flt Protected		0.998			0.971	
Satd. Flow (prot)	0	1859	1807	0	1711	0
Flt Permitted		0.998			0.971	
Satd. Flow (perm)	0	1859	1807	0	1711	0
Link Speed (mph)		25	25		25	
Link Distance (ft)		1195	2012		1616	
Travel Time (s)		32.6	54.9		44.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	81	128	36	6	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	85	164	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.0%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 8: Robertson St & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	4	73	115	32	5	4
Future Vol, veh/h	4	73	115	32	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	81	128	36	6	4

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	164	0	-	0	235 146
Stage 1	-	-	-	-	146 -
Stage 2	-	-	-	-	89 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1414	-	-	-	753 901
Stage 1	-	-	-	-	881 -
Stage 2	-	-	-	-	934 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1414	-	-	-	751 901
Mov Cap-2 Maneuver	-	-	-	-	751 -
Stage 1	-	-	-	-	878 -
Stage 2	-	-	-	-	934 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1414	-	-	-	811
HCM Lane V/C Ratio	0.003	-	-	-	0.012
HCM Control Delay (s)	7.6	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Robertson Street Assemblage TIA
 14: Mailman Rd & Robertson St/Knightdale Eagle Rock Rd

10/06/2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	77	4	19	131	7	19
Future Volume (vph)	77	4	19	131	7	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.994			0.902		
Flt Protected				0.994	0.986	
Satd. Flow (prot)	1852	0	0	1852	1657	0
Flt Permitted				0.994	0.986	
Satd. Flow (perm)	1852	0	0	1852	1657	0
Link Speed (mph)	35			45	55	
Link Distance (ft)	852			285	807	
Travel Time (s)	16.6			4.3	10.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	86	4	21	146	8	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	90	0	0	167	29	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	24.6%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 14: Mailman Rd & Robertson St/Knightdale Eagle Rock Rd

10/06/2022

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	77	4	19	131	7	19
Future Vol, veh/h	77	4	19	131	7	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	86	4	21	146	8	21

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	90	0	276 88
Stage 1	-	-	-	-	88 -
Stage 2	-	-	-	-	188 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1505	-	714 970
Stage 1	-	-	-	-	935 -
Stage 2	-	-	-	-	844 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1505	-	703 970
Mov Cap-2 Maneuver	-	-	-	-	703 -
Stage 1	-	-	-	-	935 -
Stage 2	-	-	-	-	831 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	880	-	-	1505	-
HCM Lane V/C Ratio	0.033	-	-	0.014	-
HCM Control Delay (s)	9.2	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	88	147	11	23	11
Future Volume (vph)	5	88	147	11	23	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.991		0.957	
Flt Protected		0.997			0.967	
Satd. Flow (prot)	0	1857	1846	0	1724	0
Flt Permitted		0.997			0.967	
Satd. Flow (perm)	0	1857	1846	0	1724	0
Link Speed (mph)		45	45		45	
Link Distance (ft)		1096	1080		2466	
Travel Time (s)		16.6	16.4		37.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	98	163	12	26	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	104	175	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.7%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	5	88	147	11	23	11
Future Vol, veh/h	5	88	147	11	23	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	98	163	12	26	12

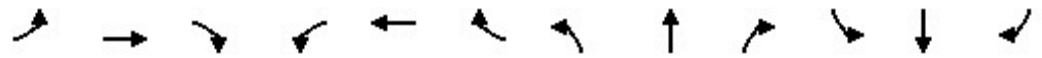
Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	175	0	-	0	279
Stage 1	-	-	-	-	169
Stage 2	-	-	-	-	110
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1401	-	-	-	711
Stage 1	-	-	-	-	861
Stage 2	-	-	-	-	915
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1401	-	-	-	707
Mov Cap-2 Maneuver	-	-	-	-	707
Stage 1	-	-	-	-	857
Stage 2	-	-	-	-	915

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1401	-	-	-	754
HCM Lane V/C Ratio	0.004	-	-	-	0.05
HCM Control Delay (s)	7.6	0	-	-	10
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Robertson Street Assemblage TIA
17: Smithfield Rd & First Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	222	156	4	33	160	27	8	217	46	8	133	130
Future Volume (vph)	222	156	4	33	160	27	8	217	46	8	133	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			-2%			8%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.983			0.977			0.935	
Flt Protected		0.972			0.993			0.999			0.999	
Satd. Flow (prot)	0	1791	0	0	1836	0	0	1836	0	0	1670	0
Flt Permitted		0.721			0.904			0.984			0.985	
Satd. Flow (perm)	0	1328	0	0	1672	0	0	1809	0	0	1647	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1108			1409			1184			1107	
Travel Time (s)		30.2			38.4			23.1			21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	247	173	4	37	178	30	9	241	51	9	148	144
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	424	0	0	245	0	0	301	0	0	301	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	0.99	0.99	0.99	0.99	0.99	0.99	1.05	1.05	1.05
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	36.0	36.0		36.0	36.0		24.0	24.0		24.0	24.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	31.5	31.5		31.2	31.2		18.8	18.8		18.9	18.9	
Yellow Time (s)	3.1	3.1		3.3	3.3		4.0	4.0		3.4	3.4	
All-Red Time (s)	1.4	1.4		1.5	1.5		1.2	1.2		1.7	1.7	
Lost Time Adjust (s)		0.5			0.2			-0.2			-0.1	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		18.5			18.5			12.3			12.3	
Actuated g/C Ratio		0.44			0.44			0.30			0.30	
v/c Ratio		0.72			0.33			0.56			0.62	

Robertson Street Assemblage TIA
 17: Smithfield Rd & First Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		17.7			9.1			18.5			20.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		17.7			9.1			18.5			20.4	
LOS		B			A			B			C	
Approach Delay		17.7			9.1			18.5			20.4	
Approach LOS		B			A			B			C	
Queue Length 50th (ft)		69			32			54			56	
Queue Length 95th (ft)		184			84			154			160	
Internal Link Dist (ft)		1028			1329			1104			1027	
Turn Bay Length (ft)												
Base Capacity (vph)		1032			1300			895			814	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.41			0.19			0.34			0.37	

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	41.6
Natural Cycle:	50
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	16.8
Intersection LOS:	B
Intersection Capacity Utilization:	63.8%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 17: Smithfield Rd & First Ave



Robertson Street Assemblage TIA
1: Carolinian Ave & Knightdale Blvd

10/06/2022



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↑↑	↗	↖	↑↑	↖↗	↗
Traffic Volume (vph)	22	1383	105	31	805	93	34
Future Volume (vph)	22	1383	105	31	805	93	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			3%	-1%	
Storage Length (ft)	250		225	275		275	275
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Frt			0.850				0.850
Flt Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1787	3575	1599	1743	3486	3450	1591
Flt Permitted	0.307			0.095		0.950	
Satd. Flow (perm)	578	3575	1599	174	3486	3450	1591
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	25	
Link Distance (ft)		948			1123	1095	
Travel Time (s)		14.4			17.0	29.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	24	1537	117	34	894	103	38
Shared Lane Traffic (%)							
Lane Group Flow (vph)	24	1537	117	34	894	103	38
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		12			12	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	0.99	1.02	1.02	0.99	0.99
Turning Speed (mph)	9		9	15		15	9
Turn Type	D.Pm	NA	pm+ov	D.P+P	NA	Prot	pm+ov
Protected Phases		2	8	1	6	8	1
Permitted Phases	6		2	2			8
Detector Phase	6	2	8	1	6	8	1
Switch Phase							
Minimum Initial (s)	12.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	25.0	32.1	25.0	14.0	25.0	25.0	14.0
Total Split (s)	65.0	51.0	25.0	14.0	65.0	25.0	14.0
Total Split (%)	72.2%	56.7%	27.8%	15.6%	72.2%	27.8%	15.6%
Maximum Green (s)	57.9	43.9	18.1	7.3	57.9	18.1	7.3
Yellow Time (s)	4.7	4.7	3.0	3.0	4.7	3.0	3.0
All-Red Time (s)	2.4	2.4	3.9	3.7	2.4	3.9	3.7
Lost Time Adjust (s)	-2.1	-2.1	-1.9	-1.7	-2.1	-1.9	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lag		Lead			Lead
Lead-Lag Optimize?		Yes		Yes			Yes
Vehicle Extension (s)	6.0	6.0	2.0	2.0	6.0	2.0	2.0
Minimum Gap (s)	3.0	3.0	2.0	2.0	3.0	2.0	2.0

Robertson Street Assemblage TIA
1: Carolinian Ave & Knightdale Blvd

10/06/2022



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Time Before Reduce (s)	20.0	20.0	0.0	0.0	20.0	0.0	0.0
Time To Reduce (s)	45.0	45.0	0.0	0.0	45.0	0.0	0.0
Recall Mode	Min	Min	None	None	Min	None	None
Walk Time (s)		7.0					
Flash Dont Walk (s)		18.0					
Pedestrian Calls (#/hr)		0					
Act Effct Green (s)	50.1	42.6	59.4	47.4	50.1	9.4	23.3
Actuated g/C Ratio	0.72	0.61	0.85	0.68	0.72	0.13	0.33
v/c Ratio	0.06	0.70	0.09	0.11	0.36	0.22	0.07
Control Delay	3.0	12.8	2.3	3.6	4.0	30.5	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	12.8	2.3	3.6	4.0	30.5	19.3
LOS	A	B	A	A	A	C	B
Approach Delay		12.0			4.0	27.5	
Approach LOS		B			A	C	
Queue Length 50th (ft)	2	262	11	3	56	21	12
Queue Length 95th (ft)	8	363	22	9	85	46	35
Internal Link Dist (ft)		868			1043	1015	
Turn Bay Length (ft)	250		225	275		275	275
Base Capacity (vph)	500	2397	1494	324	3017	1006	539
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.64	0.08	0.10	0.30	0.10	0.07

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 69.7

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 10.1

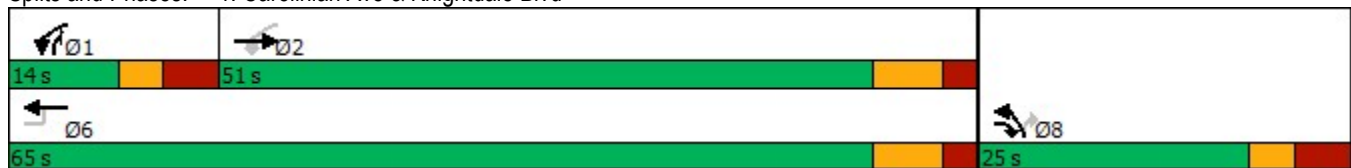
Intersection LOS: B

Intersection Capacity Utilization 52.4%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Carolinian Ave & Knightdale Blvd



Robertson Street Assemblage TIA
 2: Carolinian Ave & Knightdale Station Run

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	16	18	27	4	28	35	18	37	4	29	49	30
Future Volume (vph)	16	18	27	4	28	35	18	37	4	29	49	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.940			0.929			0.992			0.963	
Flt Protected		0.987			0.997			0.985			0.987	
Satd. Flow (prot)	0	1728	0	0	1725	0	0	1820	0	0	1771	0
Flt Permitted		0.987			0.997			0.985			0.987	
Satd. Flow (perm)	0	1728	0	0	1725	0	0	1820	0	0	1771	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		910			556			1007			1095	
Travel Time (s)		24.8			15.2			27.5			29.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	18	20	30	4	31	39	20	41	4	32	54	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	68	0	0	74	0	0	65	0	0	119	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.0%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
3: First Ave & Knightdale Station Run

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	58	39	290	67	72	318
Future Volume (vph)	58	39	290	67	72	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.975			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1816	0	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1816	0	1770	1863
Link Speed (mph)	25		35			35
Link Distance (ft)	1463		1498			771
Travel Time (s)	39.9		29.2			15.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	64	43	322	74	80	353
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	43	396	0	80	353
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.7%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
3: First Ave & Knightdale Station Run

10/06/2022

Intersection						
Int Delay, s/veh	2.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	58	39	290	67	72	318
Future Vol, veh/h	58	39	290	67	72	318
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	64	43	322	74	80	353

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	872	359	0	0	396
Stage 1	359	-	-	-	-
Stage 2	513	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	321	685	-	-	1163
Stage 1	707	-	-	-	-
Stage 2	601	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	299	685	-	-	1163
Mov Cap-2 Maneuver	299	-	-	-	-
Stage 1	707	-	-	-	-
Stage 2	560	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.4	0	1.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	299	685	1163	-
HCM Lane V/C Ratio	-	-	0.216	0.063	0.069	-
HCM Control Delay (s)	-	-	20.3	10.6	8.3	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.8	0.2	0.2	-

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	9	34	6	4	18	4	14	4	4	4	4	18
Future Volume (vph)	9	34	6	4	18	4	14	4	4	4	4	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.983			0.981			0.977			0.904	
Fl _t Protected		0.991			0.993			0.968			0.993	
Satd. Flow (prot)	0	1815	0	0	1815	0	0	1762	0	0	1672	0
Fl _t Permitted		0.991			0.993			0.968			0.993	
Satd. Flow (perm)	0	1815	0	0	1815	0	0	1762	0	0	1672	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1007			1193			1169			1254	
Travel Time (s)		27.5			32.5			31.9			34.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	38	7	4	20	4	16	4	4	4	4	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	55	0	0	28	0	0	24	0	0	28	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.2%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	34	6	4	18	4	14	4	4	4	4	18
Future Vol, veh/h	9	34	6	4	18	4	14	4	4	4	4	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	38	7	4	20	4	16	4	4	4	4	20

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	24	0	0	45	0	0	104	94	42	96	95	22
Stage 1	-	-	-	-	-	-	62	62	-	30	30	-
Stage 2	-	-	-	-	-	-	42	32	-	66	65	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1591	-	-	1563	-	-	876	796	1029	887	795	1055
Stage 1	-	-	-	-	-	-	949	843	-	987	870	-
Stage 2	-	-	-	-	-	-	972	868	-	945	841	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1591	-	-	1563	-	-	850	789	1029	874	788	1055
Mov Cap-2 Maneuver	-	-	-	-	-	-	850	789	-	874	788	-
Stage 1	-	-	-	-	-	-	943	838	-	981	867	-
Stage 2	-	-	-	-	-	-	946	865	-	930	836	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	1.1	9.3	8.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	865	1591	-	-	1563	-	-	973
HCM Lane V/C Ratio	0.028	0.006	-	-	0.003	-	-	0.03
HCM Control Delay (s)	9.3	7.3	0	-	7.3	0	-	8.8
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	4	4	4	20	33	5
Future Volume (vph)	4	4	4	20	33	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932				0.981	
Flt Protected	0.976			0.992		
Satd. Flow (prot)	1694	0	0	1848	1827	0
Flt Permitted	0.976			0.992		
Satd. Flow (perm)	1694	0	0	1848	1827	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	997			2466	1085	
Travel Time (s)	27.2			37.4	16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	4	4	22	37	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	0	26	43	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.5%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	4	4	4	20	33	5
Future Vol, veh/h	4	4	4	20	33	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	4	4	22	37	6

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	70	40	43	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	30	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	934	1031	1566	-	-	-
Stage 1	982	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	931	1031	1566	-	-	-
Mov Cap-2 Maneuver	931	-	-	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	993	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1566	-	978	-	-
HCM Lane V/C Ratio	0.003	-	0.009	-	-
HCM Control Delay (s)	7.3	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Robertson Street Assemblage TIA

6: First Ave & Keith St

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	13	6	272	6	7	286
Future Volume (vph)	13	6	272	6	7	286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.955		0.997			
Flt Protected	0.968					0.999
Satd. Flow (prot)	1722	0	1857	0	0	1861
Flt Permitted	0.968					0.999
Satd. Flow (perm)	1722	0	1857	0	0	1861
Link Speed (mph)	15		35			35
Link Distance (ft)	1616		1292			1498
Travel Time (s)	73.5		25.2			29.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	14	7	302	7	8	318
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	0	309	0	0	326
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	30.7%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
6: First Ave & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	13	6	272	6	7	286
Future Vol, veh/h	13	6	272	6	7	286
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	7	302	7	8	318

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	640	306	0	0	309	0
Stage 1	306	-	-	-	-	-
Stage 2	334	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	440	734	-	-	1252	-
Stage 1	747	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	436	734	-	-	1252	-
Mov Cap-2 Maneuver	436	-	-	-	-	-
Stage 1	747	-	-	-	-	-
Stage 2	719	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.5	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	500	1252
HCM Lane V/C Ratio	-	-	0.042	0.006
HCM Control Delay (s)	-	-	12.5	7.9
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Robertson Street Assemblage TIA
7: First Ave & Robertson St

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	86	50	196	142	78	258
Future Volume (vph)	86	50	196	142	78	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.950		0.943			
Flt Protected	0.969					0.989
Satd. Flow (prot)	1715	0	1757	0	0	1842
Flt Permitted	0.969					0.989
Satd. Flow (perm)	1715	0	1757	0	0	1842
Link Speed (mph)	25		35			35
Link Distance (ft)	1195		1409			1292
Travel Time (s)	32.6		27.4			25.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	96	56	218	158	87	287
Shared Lane Traffic (%)						
Lane Group Flow (vph)	152	0	376	0	0	374
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	54.7%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
7: First Ave & Robertson St

10/06/2022

Intersection						
Int Delay, s/veh	3.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	86	50	196	142	78	258
Future Vol, veh/h	86	50	196	142	78	258
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	96	56	218	158	87	287

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	758	297	0	0	376	0
Stage 1	297	-	-	-	-	-
Stage 2	461	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	375	742	-	-	1182	-
Stage 1	754	-	-	-	-	-
Stage 2	635	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	342	742	-	-	1182	-
Mov Cap-2 Maneuver	342	-	-	-	-	-
Stage 1	754	-	-	-	-	-
Stage 2	579	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18	0	1.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	427	1182
HCM Lane V/C Ratio	-	-	0.354	0.073
HCM Control Delay (s)	-	-	18	8.3
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	1.6	0.2



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	4	166	131	7	11	5
Future Volume (vph)	4	166	131	7	11	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.993		0.955	
Flt Protected		0.999			0.968	
Satd. Flow (prot)	0	1861	1850	0	1722	0
Flt Permitted		0.999			0.968	
Satd. Flow (perm)	0	1861	1850	0	1722	0
Link Speed (mph)		25	25		25	
Link Distance (ft)		1195	2012		1616	
Travel Time (s)		32.6	54.9		44.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	184	146	8	12	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	188	154	0	18	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.0%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 8: Robertson St & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	4	166	131	7	11	5
Future Vol, veh/h	4	166	131	7	11	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	184	146	8	12	6

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	154	0	0	342	150
Stage 1	-	-	-	150	-
Stage 2	-	-	-	192	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1426	-	-	654	896
Stage 1	-	-	-	878	-
Stage 2	-	-	-	841	-
Platoon blocked, %		-	-		
Mov Cap-1 Maneuver	1426	-	-	652	896
Mov Cap-2 Maneuver	-	-	-	652	-
Stage 1	-	-	-	875	-
Stage 2	-	-	-	841	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1426	-	-	-	713
HCM Lane V/C Ratio	0.003	-	-	-	0.025
HCM Control Delay (s)	7.5	0	-	-	10.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Robertson Street Assemblage TIA
 14: Mailman Rd & Robertson St/Knightdale Eagle Rock Rd

10/06/2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	150	8	27	138	4	32
Future Volume (vph)	150	8	27	138	4	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.993			0.878		
Flt Protected				0.992	0.995	
Satd. Flow (prot)	1850	0	0	1848	1627	0
Flt Permitted				0.992	0.995	
Satd. Flow (perm)	1850	0	0	1848	1627	0
Link Speed (mph)	35			45	55	
Link Distance (ft)	852			285	807	
Travel Time (s)	16.6			4.3	10.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	167	9	30	153	4	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	176	0	0	183	40	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	30.5%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 14: Mailman Rd & Robertson St/Knightdale Eagle Rock Rd

10/06/2022

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	150	8	27	138	4	32
Future Vol, veh/h	150	8	27	138	4	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	167	9	30	153	4	36

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	176	0	385 172
Stage 1	-	-	-	-	172 -
Stage 2	-	-	-	-	213 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1400	-	618 872
Stage 1	-	-	-	-	858 -
Stage 2	-	-	-	-	823 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1400	-	604 872
Mov Cap-2 Maneuver	-	-	-	-	604 -
Stage 1	-	-	-	-	858 -
Stage 2	-	-	-	-	804 -

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	831	-	-	1400	-
HCM Lane V/C Ratio	0.048	-	-	0.021	-
HCM Control Delay (s)	9.6	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	7	181	142	14	24	17
Future Volume (vph)	7	181	142	14	24	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.988		0.944	
Flt Protected		0.998			0.971	
Satd. Flow (prot)	0	1859	1840	0	1707	0
Flt Permitted		0.998			0.971	
Satd. Flow (perm)	0	1859	1840	0	1707	0
Link Speed (mph)		45	45		45	
Link Distance (ft)		1096	1080		2466	
Travel Time (s)		16.6	16.4		37.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	201	158	16	27	19
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	209	174	0	46	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	25.2%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	7	181	142	14	24	17
Future Vol, veh/h	7	181	142	14	24	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	201	158	16	27	19

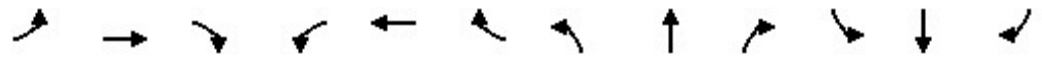
Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	174	0	-	0	383 166
Stage 1	-	-	-	-	166 -
Stage 2	-	-	-	-	217 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1403	-	-	-	620 878
Stage 1	-	-	-	-	863 -
Stage 2	-	-	-	-	819 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1403	-	-	-	616 878
Mov Cap-2 Maneuver	-	-	-	-	616 -
Stage 1	-	-	-	-	858 -
Stage 2	-	-	-	-	819 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1403	-	-	-	703
HCM Lane V/C Ratio	0.006	-	-	-	0.065
HCM Control Delay (s)	7.6	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Robertson Street Assemblage TIA
17: Smithfield Rd & First Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	228	168	12	67	259	17	9	247	26	4	292	302
Future Volume (vph)	228	168	12	67	259	17	9	247	26	4	292	302
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			-2%			8%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.993			0.987			0.932	
Flt Protected		0.973			0.990			0.998				
Satd. Flow (prot)	0	1787	0	0	1850	0	0	1853	0	0	1667	0
Flt Permitted		0.595			0.857			0.978			0.998	
Satd. Flow (perm)	0	1093	0	0	1601	0	0	1816	0	0	1663	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1108			1409			1184			1107	
Travel Time (s)		30.2			38.4			23.1			21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	253	187	13	74	288	19	10	274	29	4	324	336
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	453	0	0	381	0	0	313	0	0	664	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	0.99	0.99	0.99	0.99	0.99	0.99	1.05	1.05	1.05
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	41.0	41.0		41.0	41.0		39.0	39.0		39.0	39.0	
Total Split (%)	51.3%	51.3%		51.3%	51.3%		48.8%	48.8%		48.8%	48.8%	
Maximum Green (s)	36.5	36.5		36.2	36.2		33.8	33.8		33.9	33.9	
Yellow Time (s)	3.1	3.1		3.3	3.3		4.0	4.0		3.4	3.4	
All-Red Time (s)	1.4	1.4		1.5	1.5		1.2	1.2		1.7	1.7	
Lost Time Adjust (s)		0.5			0.2			-0.2			-0.1	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		33.8			33.8			32.2			32.2	
Actuated g/C Ratio		0.44			0.44			0.42			0.42	
v/c Ratio		0.93			0.54			0.41			0.94	

Robertson Street Assemblage TIA
 17: Smithfield Rd & First Ave

10/06/2022

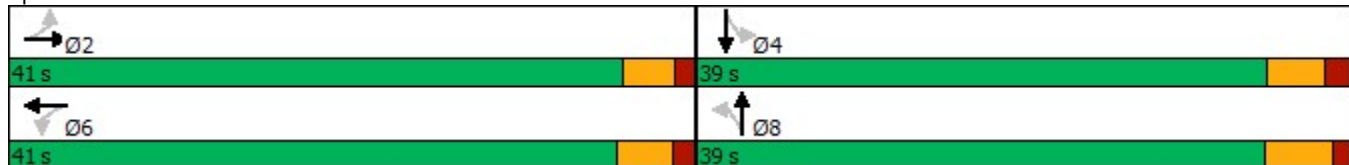


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		50.7			19.2			17.7			46.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		50.7			19.2			17.7			46.6	
LOS		D			B			B			D	
Approach Delay		50.7			19.2			17.7			46.6	
Approach LOS		D			B			B			D	
Queue Length 50th (ft)		204			132			105			307	
Queue Length 95th (ft)		#394			213			170			#528	
Internal Link Dist (ft)		1028			1329			1104			1027	
Turn Bay Length (ft)												
Base Capacity (vph)		522			766			820			751	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.87			0.50			0.38			0.88	

Intersection Summary

Area Type:	Other
Cycle Length:	80
Actuated Cycle Length:	76.1
Natural Cycle:	80
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.94
Intersection Signal Delay:	36.9
Intersection LOS:	D
Intersection Capacity Utilization:	88.7%
ICU Level of Service:	E
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 17: Smithfield Rd & First Ave



MOVEMENT SUMMARY

Site: 2 [Knightdale Station Run / Carolinian Ave (Site Folder: Robertson St TIA)]

2022 Existing AM Peak Hour
 Site Category: Existing Design
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Carolinian Ave														
3	L2	12	2.0	13	2.0	0.111	5.1	LOS A	0.5	11.7	0.50	0.40	0.50	24.5
8	T1	58	2.0	64	2.0	0.111	5.1	LOS A	0.5	11.7	0.50	0.40	0.50	24.1
18	R2	18	2.0	20	2.0	0.111	5.1	LOS A	0.5	11.7	0.50	0.40	0.50	23.6
Approach		88	2.0	98	2.0	0.111	5.1	LOS A	0.5	11.7	0.50	0.40	0.50	24.1
East: Knightdale Station Run														
1	L2	8	2.0	9	2.0	0.278	5.5	LOS A	1.5	37.9	0.29	0.15	0.29	24.5
6	T1	98	2.0	109	2.0	0.278	5.5	LOS A	1.5	37.9	0.29	0.15	0.29	24.1
16	R2	199	2.0	221	2.0	0.278	5.5	LOS A	1.5	37.9	0.29	0.15	0.29	23.5
Approach		305	2.0	339	2.0	0.278	5.5	LOS A	1.5	37.9	0.29	0.15	0.29	23.7
North: Carolinian Ave														
7	L2	196	2.0	218	2.0	0.224	5.0	LOS A	1.1	28.4	0.32	0.18	0.32	23.7
4	T1	25	2.0	28	2.0	0.224	5.0	LOS A	1.1	28.4	0.32	0.18	0.32	23.3
14	R2	17	2.0	19	2.0	0.224	5.0	LOS A	1.1	28.4	0.32	0.18	0.32	22.9
Approach		238	2.0	264	2.0	0.224	5.0	LOS A	1.1	28.4	0.32	0.18	0.32	23.6
West: Knightdale Station Run														
5	L2	19	2.0	21	2.0	0.198	5.3	LOS A	0.9	23.4	0.43	0.31	0.43	24.5
2	T1	154	2.0	171	2.0	0.198	5.3	LOS A	0.9	23.4	0.43	0.31	0.43	24.2
12	R2	12	2.0	13	2.0	0.198	5.3	LOS A	0.9	23.4	0.43	0.31	0.43	23.6
Approach		185	2.0	206	2.0	0.198	5.3	LOS A	0.9	23.4	0.43	0.31	0.43	24.2
All Vehicles		816	2.0	907	2.0	0.278	5.3	LOS A	1.5	37.9	0.35	0.22	0.35	23.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Knightdale Station Run / Carolinian Ave (Site Folder: Robertson St TIA)]

2022 Existing PM Peak Hour
 Site Category: Existing Design
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] ft				
South: Carolinian Ave														
3	L2	18	2.0	20	2.0	0.052	3.3	LOS A	0.2	5.7	0.19	0.07	0.19	24.8
8	T1	37	2.0	41	2.0	0.052	3.3	LOS A	0.2	5.7	0.19	0.07	0.19	24.4
18	R2	4	2.0	4	2.0	0.052	3.3	LOS A	0.2	5.7	0.19	0.07	0.19	23.9
Approach		59	2.0	66	2.0	0.052	3.3	LOS A	0.2	5.7	0.19	0.07	0.19	24.5
East: Knightdale Station Run														
1	L2	4	2.0	4	2.0	0.060	3.4	LOS A	0.3	6.5	0.20	0.08	0.20	25.0
6	T1	28	2.0	31	2.0	0.060	3.4	LOS A	0.3	6.5	0.20	0.08	0.20	24.6
16	R2	35	2.0	39	2.0	0.060	3.4	LOS A	0.3	6.5	0.20	0.08	0.20	24.1
Approach		67	2.0	74	2.0	0.060	3.4	LOS A	0.3	6.5	0.20	0.08	0.20	24.3
North: Carolinian Ave														
7	L2	29	2.0	32	2.0	0.094	3.6	LOS A	0.4	10.7	0.17	0.07	0.17	24.7
4	T1	49	2.0	54	2.0	0.094	3.6	LOS A	0.4	10.7	0.17	0.07	0.17	24.3
14	R2	30	2.0	33	2.0	0.094	3.6	LOS A	0.4	10.7	0.17	0.07	0.17	23.8
Approach		108	2.0	120	2.0	0.094	3.6	LOS A	0.4	10.7	0.17	0.07	0.17	24.3
West: Knightdale Station Run														
5	L2	16	2.0	18	2.0	0.055	3.4	LOS A	0.2	6.0	0.22	0.10	0.22	24.8
2	T1	18	2.0	20	2.0	0.055	3.4	LOS A	0.2	6.0	0.22	0.10	0.22	24.4
12	R2	27	2.0	30	2.0	0.055	3.4	LOS A	0.2	6.0	0.22	0.10	0.22	23.8
Approach		61	2.0	68	2.0	0.055	3.4	LOS A	0.2	6.0	0.22	0.10	0.22	24.2
All Vehicles		295	2.0	328	2.0	0.094	3.4	LOS A	0.4	10.7	0.19	0.08	0.19	24.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

2028 Background Traffic Volumes

Robertson Street Assemblage TIA
1: Carolinian Ave & Knightdale Blvd

10/06/2022



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	13	685	155	125	1224	288	123
Future Volume (vph)	13	685	155	125	1224	288	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			3%	-1%	
Storage Length (ft)	250		225	275		275	275
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Frt			0.850				0.850
Flt Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1787	3575	1599	1743	3486	3450	1591
Flt Permitted	0.148			0.275		0.950	
Satd. Flow (perm)	278	3575	1599	505	3486	3450	1591
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	25	
Link Distance (ft)		948			1123	1095	
Travel Time (s)		14.4			17.0	29.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	14	761	172	139	1360	320	137
Shared Lane Traffic (%)							
Lane Group Flow (vph)	14	761	172	139	1360	320	137
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		12			12	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	0.99	1.02	1.02	0.99	0.99
Turning Speed (mph)	9		9	15		15	9
Turn Type	D.Pm	NA	pm+ov	D.P+P	NA	Prot	pm+ov
Protected Phases		2	8	1	6	8	1
Permitted Phases	6		2	2			8
Detector Phase	6	2	8	1	6	8	1
Switch Phase							
Minimum Initial (s)	12.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	25.0	32.1	25.0	14.0	25.0	25.0	14.0
Total Split (s)	62.0	46.0	28.0	16.0	62.0	28.0	16.0
Total Split (%)	68.9%	51.1%	31.1%	17.8%	68.9%	31.1%	17.8%
Maximum Green (s)	54.9	38.9	21.1	9.3	54.9	21.1	9.3
Yellow Time (s)	4.7	4.7	3.0	3.0	4.7	3.0	3.0
All-Red Time (s)	2.4	2.4	3.9	3.7	2.4	3.9	3.7
Lost Time Adjust (s)	-2.1	-2.1	-1.9	-1.7	-2.1	-1.9	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lag		Lead			Lead
Lead-Lag Optimize?		Yes		Yes			Yes
Vehicle Extension (s)	6.0	6.0	2.0	2.0	6.0	2.0	2.0
Minimum Gap (s)	3.0	3.0	2.0	2.0	3.0	2.0	2.0

Robertson Street Assemblage TIA
 1: Carolinian Ave & Knightdale Blvd

10/06/2022

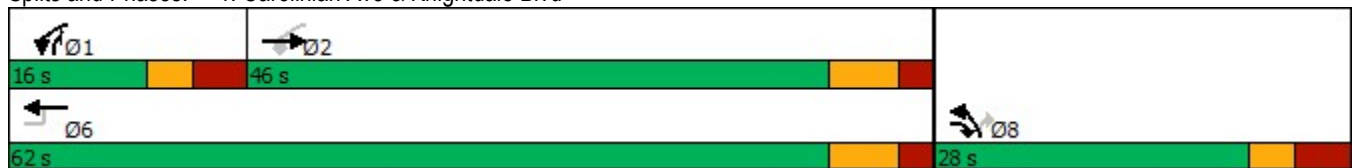


Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Time Before Reduce (s)	20.0	20.0	0.0	0.0	20.0	0.0	0.0
Time To Reduce (s)	45.0	45.0	0.0	0.0	45.0	0.0	0.0
Recall Mode	Min	Min	None	None	Min	None	None
Walk Time (s)		7.0					
Flash Dont Walk (s)		18.0					
Pedestrian Calls (#/hr)		0					
Act Effct Green (s)	36.6	22.3	39.4	31.5	36.6	12.0	26.3
Actuated g/C Ratio	0.62	0.38	0.67	0.54	0.62	0.20	0.45
v/c Ratio	0.08	0.56	0.16	0.30	0.63	0.46	0.19
Control Delay	6.1	16.2	3.7	6.8	8.5	24.0	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	16.2	3.7	6.8	8.5	24.0	12.2
LOS	A	B	A	A	A	C	B
Approach Delay		13.8			8.4	20.5	
Approach LOS		B			A	C	
Queue Length 50th (ft)	2	103	17	16	127	52	29
Queue Length 95th (ft)	9	173	36	40	219	98	69
Internal Link Dist (ft)		868			1043	1015	
Turn Bay Length (ft)	250		225	275		275	275
Base Capacity (vph)	258	2547	1383	524	3241	1379	766
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.30	0.12	0.27	0.42	0.23	0.18

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 58.8
 Natural Cycle: 75
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 12.0
 Intersection LOS: B
 Intersection Capacity Utilization 64.6%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 1: Carolinian Ave & Knightdale Blvd



Robertson Street Assemblage TIA
 2: Carolinian Ave & Knightdale Station Run

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	23	184	14	10	117	238	14	69	21	234	30	20
Future Volume (vph)	23	184	14	10	117	238	14	69	21	234	30	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.991			0.912			0.973			0.991	
Fl _t Protected		0.995			0.999			0.993			0.960	
Satd. Flow (prot)	0	1837	0	0	1697	0	0	1800	0	0	1772	0
Fl _t Permitted		0.995			0.999			0.993			0.960	
Satd. Flow (perm)	0	1837	0	0	1697	0	0	1800	0	0	1772	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		910			556			1007			1095	
Travel Time (s)		24.8			15.2			27.5			29.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	26	204	16	11	130	264	16	77	23	260	33	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	246	0	0	405	0	0	116	0	0	315	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.0%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 3: First Ave & Knightdale Station Run

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	116	31	363	162	31	238
Future Volume (vph)	116	31	363	162	31	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.958			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1785	0	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1785	0	1770	1863
Link Speed (mph)	25		35			35
Link Distance (ft)	1463		1498			771
Travel Time (s)	39.9		29.2			15.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	129	34	403	180	34	264
Shared Lane Traffic (%)						
Lane Group Flow (vph)	129	34	583	0	34	264
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.1%
	ICU Level of Service A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 3: First Ave & Knightdale Station Run

10/06/2022

Intersection						
Int Delay, s/veh	3.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	116	31	363	162	31	238
Future Vol, veh/h	116	31	363	162	31	238
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	129	34	403	180	34	264

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	825	493	0	0	583
Stage 1	493	-	-	-	-
Stage 2	332	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	342	576	-	-	991
Stage 1	614	-	-	-	-
Stage 2	727	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	330	576	-	-	991
Mov Cap-2 Maneuver	330	-	-	-	-
Stage 1	614	-	-	-	-
Stage 2	702	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.4	0	1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	330	576	991
HCM Lane V/C Ratio	-	-	0.391	0.06	0.035
HCM Control Delay (s)	-	-	22.7	11.6	8.8
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	1.8	0.2	0.1

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	6	27	5	4	32	4	19	4	4	4	4	17
Future Volume (vph)	6	27	5	4	32	4	19	4	4	4	4	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.981			0.988			0.981			0.905	
Flt Protected		0.992			0.995			0.965			0.993	
Satd. Flow (prot)	0	1813	0	0	1831	0	0	1763	0	0	1674	0
Flt Permitted		0.992			0.995			0.965			0.993	
Satd. Flow (perm)	0	1813	0	0	1831	0	0	1763	0	0	1674	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1007			1193			1169			1254	
Travel Time (s)		27.5			32.5			31.9			34.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	30	6	4	36	4	21	4	4	4	4	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	43	0	0	44	0	0	29	0	0	27	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.9%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	27	5	4	32	4	19	4	4	4	4	17
Future Vol, veh/h	6	27	5	4	32	4	19	4	4	4	4	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	30	6	4	36	4	21	4	4	4	4	19

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	40	0	0	36	0	0	105	95	33	97	96	38
Stage 1	-	-	-	-	-	-	47	47	-	46	46	-
Stage 2	-	-	-	-	-	-	58	48	-	51	50	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1570	-	-	1575	-	-	875	795	1041	885	794	1034
Stage 1	-	-	-	-	-	-	967	856	-	968	857	-
Stage 2	-	-	-	-	-	-	954	855	-	962	853	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1570	-	-	1575	-	-	851	789	1041	872	788	1034
Mov Cap-2 Maneuver	-	-	-	-	-	-	851	789	-	872	788	-
Stage 1	-	-	-	-	-	-	962	852	-	963	854	-
Stage 2	-	-	-	-	-	-	929	852	-	948	849	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.2			0.7			9.3			8.9		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	864	1570	-	-	1575	-	-	958
HCM Lane V/C Ratio	0.035	0.004	-	-	0.003	-	-	0.029
HCM Control Delay (s)	9.3	7.3	0	-	7.3	0	-	8.9
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	4	7	4	29	39	4
Future Volume (vph)	4	7	4	29	39	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.910				0.989	
Flt Protected	0.984			0.994		
Satd. Flow (prot)	1668	0	0	1852	1842	0
Flt Permitted	0.984			0.994		
Satd. Flow (perm)	1668	0	0	1852	1842	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	997			2466	1085	
Travel Time (s)	27.2			37.4	16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	8	4	32	43	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	36	47	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.9%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	4	7	4	29	39	4
Future Vol, veh/h	4	7	4	29	39	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	8	4	32	43	4

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	85	45	47	0	0
Stage 1	45	-	-	-	-
Stage 2	40	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	916	1025	1560	-	-
Stage 1	977	-	-	-	-
Stage 2	982	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	913	1025	1560	-	-
Mov Cap-2 Maneuver	913	-	-	-	-
Stage 1	974	-	-	-	-
Stage 2	982	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1560	-	981	-	-
HCM Lane V/C Ratio	0.003	-	0.012	-	-
HCM Control Delay (s)	7.3	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	61	380	4	11	321
Future Volume (vph)	5	61	380	4	11	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.876		0.999			
Flt Protected	0.996					0.998
Satd. Flow (prot)	1625	0	1861	0	0	1859
Flt Permitted	0.996					0.998
Satd. Flow (perm)	1625	0	1861	0	0	1859
Link Speed (mph)	15		35			35
Link Distance (ft)	1616		1292			1498
Travel Time (s)	73.5		25.2			29.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	68	422	4	12	357
Shared Lane Traffic (%)						
Lane Group Flow (vph)	74	0	426	0	0	369
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.5%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
6: First Ave & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	61	380	4	11	321
Future Vol, veh/h	5	61	380	4	11	321
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	68	422	4	12	357

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	805	424	0	0	426	0
Stage 1	424	-	-	-	-	-
Stage 2	381	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	352	630	-	-	1133	-
Stage 1	660	-	-	-	-	-
Stage 2	691	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	347	630	-	-	1133	-
Mov Cap-2 Maneuver	347	-	-	-	-	-
Stage 1	660	-	-	-	-	-
Stage 2	682	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.9	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	593	1133
HCM Lane V/C Ratio	-	-	0.124	0.011
HCM Control Delay (s)	-	-	11.9	8.2
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0

Robertson Street Assemblage TIA
7: First Ave & Robertson St

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	133	80	270	59	55	238
Future Volume (vph)	133	80	270	59	55	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.949		0.976			
Flt Protected	0.970					0.991
Satd. Flow (prot)	1715	0	1818	0	0	1846
Flt Permitted	0.970					0.991
Satd. Flow (perm)	1715	0	1818	0	0	1846
Link Speed (mph)	25		35			35
Link Distance (ft)	1195		1409			1292
Travel Time (s)	32.6		27.4			25.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	148	89	300	66	61	264
Shared Lane Traffic (%)						
Lane Group Flow (vph)	237	0	366	0	0	325
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.6%
Analysis Period (min)	15
	ICU Level of Service B

Robertson Street Assemblage TIA
7: First Ave & Robertson St

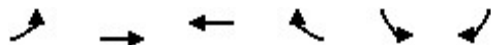
10/06/2022

Intersection						
Int Delay, s/veh	6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	133	80	270	59	55	238
Future Vol, veh/h	133	80	270	59	55	238
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	148	89	300	66	61	264

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	719	333	0	0	366
Stage 1	333	-	-	-	-
Stage 2	386	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	395	709	-	-	1193
Stage 1	726	-	-	-	-
Stage 2	687	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	371	709	-	-	1193
Mov Cap-2 Maneuver	371	-	-	-	-
Stage 1	726	-	-	-	-
Stage 2	646	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.4	0	1.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	452	1193
HCM Lane V/C Ratio	-	-	0.524	0.051
HCM Control Delay (s)	-	-	21.4	8.2
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	3	0.2



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	95	150	43	24	10
Future Volume (vph)	5	95	150	43	24	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.970		0.961	
Flt Protected		0.997			0.966	
Satd. Flow (prot)	0	1857	1807	0	1729	0
Flt Permitted		0.997			0.966	
Satd. Flow (perm)	0	1857	1807	0	1729	0
Link Speed (mph)		25	25		25	
Link Distance (ft)		1195	2012		1616	
Travel Time (s)		32.6	54.9		44.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	106	167	48	27	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	112	215	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.5%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
8: Robertson St & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	5	95	150	43	24	10
Future Vol, veh/h	5	95	150	43	24	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	106	167	48	27	11

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	215	0	0	309	191
Stage 1	-	-	-	191	-
Stage 2	-	-	-	118	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1355	-	-	683	851
Stage 1	-	-	-	841	-
Stage 2	-	-	-	907	-
Platoon blocked, %		-	-		
Mov Cap-1 Maneuver	1355	-	-	680	851
Mov Cap-2 Maneuver	-	-	-	680	-
Stage 1	-	-	-	837	-
Stage 2	-	-	-	907	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1355	-	-	-	723
HCM Lane V/C Ratio	0.004	-	-	-	0.052
HCM Control Delay (s)	7.7	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Robertson Street Assemblage TIA
 14: Mailman Rd & Robertson St/Knightdale Eagle Rock Rd

10/06/2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	108	15	23	160	22	23
Future Volume (vph)	108	15	23	160	22	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.983			0.930		
Flt Protected				0.994	0.977	
Satd. Flow (prot)	1831	0	0	1852	1693	0
Flt Permitted				0.994	0.977	
Satd. Flow (perm)	1831	0	0	1852	1693	0
Link Speed (mph)	35			45	55	
Link Distance (ft)	852			285	807	
Travel Time (s)	16.6			4.3	10.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	120	17	26	178	24	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	137	0	0	204	50	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.6%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 14: Mailman Rd & Robertson St/Knightdale Eagle Rock Rd

10/06/2022

Intersection						
Int Delay, s/veh	1.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	108	15	23	160	22	23
Future Vol, veh/h	108	15	23	160	22	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	120	17	26	178	24	26

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	137	0	359 129
Stage 1	-	-	-	-	129 -
Stage 2	-	-	-	-	230 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1447	-	640 921
Stage 1	-	-	-	-	897 -
Stage 2	-	-	-	-	808 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1447	-	627 921
Mov Cap-2 Maneuver	-	-	-	-	627 -
Stage 1	-	-	-	-	897 -
Stage 2	-	-	-	-	792 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	749	-	-	1447	-
HCM Lane V/C Ratio	0.067	-	-	0.018	-
HCM Control Delay (s)	10.2	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	11	116	179	13	27	14
Future Volume (vph)	11	116	179	13	27	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.991		0.953	
Flt Protected		0.996			0.968	
Satd. Flow (prot)	0	1855	1846	0	1718	0
Flt Permitted		0.996			0.968	
Satd. Flow (perm)	0	1855	1846	0	1718	0
Link Speed (mph)		45	45		45	
Link Distance (ft)		1096	1080		2466	
Travel Time (s)		16.6	16.4		37.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	12	129	199	14	30	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	141	213	0	46	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	25.2%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	11	116	179	13	27	14
Future Vol, veh/h	11	116	179	13	27	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	129	199	14	30	16

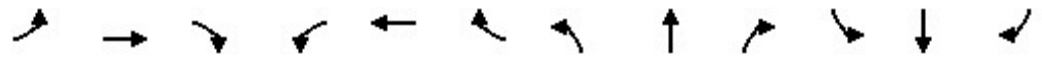
Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	213	0	-	0	359 206
Stage 1	-	-	-	-	206 -
Stage 2	-	-	-	-	153 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1357	-	-	-	640 835
Stage 1	-	-	-	-	829 -
Stage 2	-	-	-	-	875 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1357	-	-	-	634 835
Mov Cap-2 Maneuver	-	-	-	-	634 -
Stage 1	-	-	-	-	821 -
Stage 2	-	-	-	-	875 -

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1357	-	-	-	691
HCM Lane V/C Ratio	0.009	-	-	-	0.066
HCM Control Delay (s)	7.7	0	-	-	10.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Robertson Street Assemblage TIA
17: Smithfield Rd & First Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	265	188	4	44	196	37	10	330	57	12	196	155
Future Volume (vph)	265	188	4	44	196	37	10	330	57	12	196	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			-2%			8%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.982			0.981			0.942	
Flt Protected		0.972			0.992			0.999			0.998	
Satd. Flow (prot)	0	1791	0	0	1833	0	0	1844	0	0	1681	0
Flt Permitted		0.682			0.880			0.986			0.983	
Satd. Flow (perm)	0	1256	0	0	1626	0	0	1820	0	0	1656	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1108			1409			1184			1107	
Travel Time (s)		30.2			38.4			23.1			21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	294	209	4	49	218	41	11	367	63	13	218	172
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	507	0	0	308	0	0	441	0	0	403	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	0.99	0.99	0.99	0.99	0.99	0.99	1.05	1.05	1.05
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	36.0	36.0		36.0	36.0		24.0	24.0		24.0	24.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	31.5	31.5		31.2	31.2		18.8	18.8		18.9	18.9	
Yellow Time (s)	3.1	3.1		3.3	3.3		4.0	4.0		3.4	3.4	
All-Red Time (s)	1.4	1.4		1.5	1.5		1.2	1.2		1.7	1.7	
Lost Time Adjust (s)		0.5			0.2			-0.2			-0.1	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		24.5			24.5			15.9			15.9	
Actuated g/C Ratio		0.48			0.48			0.31			0.31	
v/c Ratio		0.84			0.39			0.78			0.78	

Robertson Street Assemblage TIA
 17: Smithfield Rd & First Ave

10/06/2022

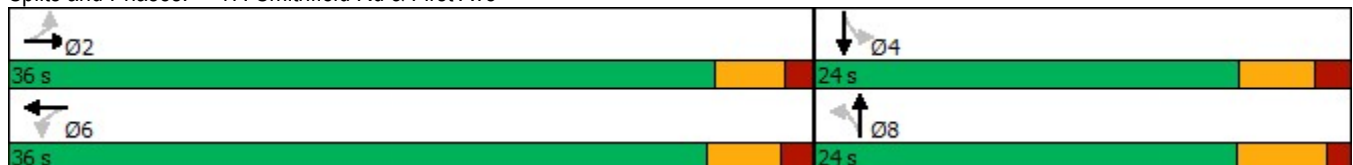


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		27.0			10.4			28.8			30.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		27.0			10.4			28.8			30.1	
LOS		C			B			C			C	
Approach Delay		27.0			10.4			28.8			30.1	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)		134			60			131			120	
Queue Length 95th (ft)		#304			109			#272			#258	
Internal Link Dist (ft)		1028			1329			1104			1027	
Turn Bay Length (ft)												
Base Capacity (vph)		804			1041			714			650	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.63			0.30			0.62			0.62	

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	51
Natural Cycle:	50
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.84
Intersection Signal Delay:	25.1
Intersection LOS:	C
Intersection Capacity Utilization:	78.0%
ICU Level of Service:	D
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 17: Smithfield Rd & First Ave



Robertson Street Assemblage TIA
1: Carolinian Ave & Knightdale Blvd

10/06/2022



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	26	1658	125	37	972	111	41
Future Volume (vph)	26	1658	125	37	972	111	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			3%	-1%	
Storage Length (ft)	250		225	275		275	275
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Frt			0.850				0.850
Flt Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1787	3575	1599	1743	3486	3450	1591
Flt Permitted	0.247			0.084		0.950	
Satd. Flow (perm)	465	3575	1599	154	3486	3450	1591
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	25	
Link Distance (ft)		948			1123	1095	
Travel Time (s)		14.4			17.0	29.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	1842	139	41	1080	123	46
Shared Lane Traffic (%)							
Lane Group Flow (vph)	29	1842	139	41	1080	123	46
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		12			12	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	0.99	1.02	1.02	0.99	0.99
Turning Speed (mph)	9		9	15		15	9
Turn Type	D.Pm	NA	pm+ov	D,P+P	NA	Prot	pm+ov
Protected Phases		2	8	1	6	8	1
Permitted Phases	6		2	2			8
Detector Phase	6	2	8	1	6	8	1
Switch Phase							
Minimum Initial (s)	12.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	25.0	32.1	25.0	14.0	25.0	25.0	14.0
Total Split (s)	65.0	51.0	25.0	14.0	65.0	25.0	14.0
Total Split (%)	72.2%	56.7%	27.8%	15.6%	72.2%	27.8%	15.6%
Maximum Green (s)	57.9	43.9	18.1	7.3	57.9	18.1	7.3
Yellow Time (s)	4.7	4.7	3.0	3.0	4.7	3.0	3.0
All-Red Time (s)	2.4	2.4	3.9	3.7	2.4	3.9	3.7
Lost Time Adjust (s)	-2.1	-2.1	-1.9	-1.7	-2.1	-1.9	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lag		Lead			Lead
Lead-Lag Optimize?		Yes		Yes			Yes
Vehicle Extension (s)	6.0	6.0	2.0	2.0	6.0	2.0	2.0
Minimum Gap (s)	3.0	3.0	2.0	2.0	3.0	2.0	2.0

Robertson Street Assemblage TIA
1: Carolinian Ave & Knightdale Blvd

10/06/2022



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Time Before Reduce (s)	20.0	20.0	0.0	0.0	20.0	0.0	0.0
Time To Reduce (s)	45.0	45.0	0.0	0.0	45.0	0.0	0.0
Recall Mode	Min	Min	None	None	Min	None	None
Walk Time (s)		7.0					
Flash Dont Walk (s)		18.0					
Pedestrian Calls (#/hr)		0					
Act Effct Green (s)	59.2	48.3	64.0	55.2	59.2	9.6	23.3
Actuated g/C Ratio	0.75	0.61	0.81	0.70	0.75	0.12	0.30
v/c Ratio	0.08	0.84	0.11	0.14	0.41	0.29	0.10
Control Delay	3.4	18.4	2.5	4.1	4.2	33.6	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.4	18.4	2.5	4.1	4.2	33.6	21.0
LOS	A	B	A	A	A	C	C
Approach Delay		17.1			4.1	30.2	
Approach LOS		B			A	C	
Queue Length 50th (ft)	3	372	14	4	75	28	16
Queue Length 95th (ft)	10	#557	25	11	114	53	40
Internal Link Dist (ft)		868			1043	1015	
Turn Bay Length (ft)	250		225	275		275	275
Base Capacity (vph)	354	2191	1462	289	2657	876	477
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.84	0.10	0.14	0.41	0.14	0.10

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 78.8
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 13.4
 Intersection LOS: B
 Intersection Capacity Utilization 60.0%
 ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Carolinian Ave & Knightdale Blvd



Robertson Street Assemblage TIA
 2: Carolinian Ave & Knightdale Station Run

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	19	21	32	4	33	42	21	44	4	35	59	36
Future Volume (vph)	19	21	32	4	33	42	21	44	4	35	59	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.939			0.928			0.993			0.963	
Fl _t Protected		0.987			0.998			0.985			0.987	
Satd. Flow (prot)	0	1726	0	0	1725	0	0	1822	0	0	1771	0
Fl _t Permitted		0.987			0.998			0.985			0.987	
Satd. Flow (perm)	0	1726	0	0	1725	0	0	1822	0	0	1771	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		910			556			1007			1095	
Travel Time (s)		24.8			15.2			27.5			29.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	21	23	36	4	37	47	23	49	4	39	66	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	80	0	0	88	0	0	76	0	0	145	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	26.6%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 3: First Ave & Knightdale Station Run

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	69	47	362	80	86	406
Future Volume (vph)	69	47	362	80	86	406
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.976			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1818	0	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1818	0	1770	1863
Link Speed (mph)	25		35			35
Link Distance (ft)	1463		1498			771
Travel Time (s)	39.9		29.2			15.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	77	52	402	89	96	451
Shared Lane Traffic (%)						
Lane Group Flow (vph)	77	52	491	0	96	451
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.5%
	ICU Level of Service A
Analysis Period (min)	15

Robertson Street Assemblage TIA
3: First Ave & Knightdale Station Run

10/06/2022

Intersection						
Int Delay, s/veh	3.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖		↖	↗
Traffic Vol, veh/h	69	47	362	80	86	406
Future Vol, veh/h	69	47	362	80	86	406
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	52	402	89	96	451

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1090	447	0	0	491
Stage 1	447	-	-	-	-
Stage 2	643	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	238	612	-	-	1072
Stage 1	644	-	-	-	-
Stage 2	523	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	217	612	-	-	1072
Mov Cap-2 Maneuver	217	-	-	-	-
Stage 1	644	-	-	-	-
Stage 2	476	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.7	0	1.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	217	612	1072	-
HCM Lane V/C Ratio	-	-	0.353	0.085	0.089	-
HCM Control Delay (s)	-	-	30.4	11.4	8.7	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	1.5	0.3	0.3	-

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	11	41	7	4	21	4	17	4	4	4	4	21
Future Volume (vph)	11	41	7	4	21	4	17	4	4	4	4	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.984			0.983			0.980			0.900	
Fl _t Protected		0.991			0.994			0.966			0.994	
Satd. Flow (prot)	0	1816	0	0	1820	0	0	1763	0	0	1666	0
Fl _t Permitted		0.991			0.994			0.966			0.994	
Satd. Flow (perm)	0	1816	0	0	1820	0	0	1763	0	0	1666	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1007			1193			1169			1254	
Travel Time (s)		27.5			32.5			31.9			34.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	12	46	8	4	23	4	19	4	4	4	4	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	66	0	0	31	0	0	27	0	0	31	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.3%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	41	7	4	21	4	17	4	4	4	4	21
Future Vol, veh/h	11	41	7	4	21	4	17	4	4	4	4	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	46	8	4	23	4	19	4	4	4	4	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	27	0	0	54	0	0	121	109	50	111	111	25
Stage 1	-	-	-	-	-	-	74	74	-	33	33	-
Stage 2	-	-	-	-	-	-	47	35	-	78	78	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1587	-	-	1551	-	-	854	781	1018	867	779	1051
Stage 1	-	-	-	-	-	-	935	833	-	983	868	-
Stage 2	-	-	-	-	-	-	967	866	-	931	830	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1587	-	-	1551	-	-	824	772	1018	852	770	1051
Mov Cap-2 Maneuver	-	-	-	-	-	-	824	772	-	852	770	-
Stage 1	-	-	-	-	-	-	928	826	-	975	865	-
Stage 2	-	-	-	-	-	-	938	863	-	915	823	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.4			1			9.4			8.8		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	841	1587	-	-	1551	-	-	971
HCM Lane V/C Ratio	0.033	0.008	-	-	0.003	-	-	0.033
HCM Control Delay (s)	9.4	7.3	0	-	7.3	0	-	8.8
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	4	4	4	27	44	6
Future Volume (vph)	4	4	4	27	44	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932			0.983		
Flt Protected	0.976			0.994		
Satd. Flow (prot)	1694	0	0	1852	1831	0
Flt Permitted	0.976			0.994		
Satd. Flow (perm)	1694	0	0	1852	1831	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	997			2466	1085	
Travel Time (s)	27.2			37.4	16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	4	4	30	49	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	0	34	56	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.8%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	4	4	4	27	44	6
Future Vol, veh/h	4	4	4	27	44	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	4	4	30	49	7

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	91	53	56	0	0
Stage 1	53	-	-	-	-
Stage 2	38	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	909	1014	1549	-	-
Stage 1	970	-	-	-	-
Stage 2	984	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	906	1014	1549	-	-
Mov Cap-2 Maneuver	906	-	-	-	-
Stage 1	967	-	-	-	-
Stage 2	984	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1549	-	957	-	-
HCM Lane V/C Ratio	0.003	-	0.009	-	-
HCM Control Delay (s)	7.3	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	19	15	333	12	22	353
Future Volume (vph)	19	15	333	12	22	353
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.940		0.995			
Flt Protected	0.973					0.997
Satd. Flow (prot)	1704	0	1853	0	0	1857
Flt Permitted	0.973					0.997
Satd. Flow (perm)	1704	0	1853	0	0	1857
Link Speed (mph)	15		35			35
Link Distance (ft)	1616		1292			1498
Travel Time (s)	73.5		25.2			29.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	21	17	370	13	24	392
Shared Lane Traffic (%)						
Lane Group Flow (vph)	38	0	383	0	0	416
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.6%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
6: First Ave & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Vol, veh/h	19	15	333	12	22	353
Future Vol, veh/h	19	15	333	12	22	353
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	17	370	13	24	392

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	817	377	0	0	383	0
Stage 1	377	-	-	-	-	-
Stage 2	440	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	346	670	-	-	1175	-
Stage 1	694	-	-	-	-	-
Stage 2	649	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	337	670	-	-	1175	-
Mov Cap-2 Maneuver	337	-	-	-	-	-
Stage 1	694	-	-	-	-	-
Stage 2	632	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.1	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	432	1175
HCM Lane V/C Ratio	-	-	0.087	0.021
HCM Control Delay (s)	-	-	14.1	8.1
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1

Robertson Street Assemblage TIA
7: First Ave & Robertson St

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	109	68	239	180	105	311
Future Volume (vph)	109	68	239	180	105	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.948		0.942			
Flt Protected	0.970					0.988
Satd. Flow (prot)	1713	0	1755	0	0	1840
Flt Permitted	0.970					0.988
Satd. Flow (perm)	1713	0	1755	0	0	1840
Link Speed (mph)	25		35			35
Link Distance (ft)	1195		1409			1292
Travel Time (s)	32.6		27.4			25.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	121	76	266	200	117	346
Shared Lane Traffic (%)						
Lane Group Flow (vph)	197	0	466	0	0	463
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	65.9%
Analysis Period (min)	15
	ICU Level of Service C

Robertson Street Assemblage TIA
7: First Ave & Robertson St

10/06/2022

Intersection						
Int Delay, s/veh	6.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	109	68	239	180	105	311
Future Vol, veh/h	109	68	239	180	105	311
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	121	76	266	200	117	346

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	946	366	0	0	466	0
Stage 1	366	-	-	-	-	-
Stage 2	580	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	290	679	-	-	1095	-
Stage 1	702	-	-	-	-	-
Stage 2	560	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	252	679	-	-	1095	-
Mov Cap-2 Maneuver	252	-	-	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	486	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	30.4	0	2.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	332	1095
HCM Lane V/C Ratio	-	-	0.592	0.107
HCM Control Delay (s)	-	-	30.4	8.7
HCM Lane LOS	-	-	D	A
HCM 95th %tile Q(veh)	-	-	3.6	0.4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	15	210	164	29	26	12
Future Volume (vph)	15	210	164	29	26	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.980		0.958	
Flt Protected		0.997			0.967	
Satd. Flow (prot)	0	1857	1825	0	1726	0
Flt Permitted		0.997			0.967	
Satd. Flow (perm)	0	1857	1825	0	1726	0
Link Speed (mph)		25	25		25	
Link Distance (ft)		1195	2012		1616	
Travel Time (s)		32.6	54.9		44.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	17	233	182	32	29	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	250	214	0	42	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.4%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
8: Robertson St & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	15	210	164	29	26	12
Future Vol, veh/h	15	210	164	29	26	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	233	182	32	29	13

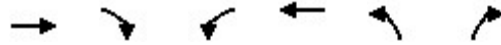
Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	214	0	-	0	465 198
Stage 1	-	-	-	-	198 -
Stage 2	-	-	-	-	267 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1356	-	-	-	556 843
Stage 1	-	-	-	-	835 -
Stage 2	-	-	-	-	778 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1356	-	-	-	548 843
Mov Cap-2 Maneuver	-	-	-	-	548 -
Stage 1	-	-	-	-	823 -
Stage 2	-	-	-	-	778 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1356	-	-	-	616
HCM Lane V/C Ratio	0.012	-	-	-	0.069
HCM Control Delay (s)	7.7	0	-	-	11.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Robertson Street Assemblage TIA
 14: Mailman Rd & Robertson St/Knightdale Eagle Rock Rd

10/06/2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	190	24	32	183	15	38
Future Volume (vph)	190	24	32	183	15	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.985			0.904		
Fl _t Protected				0.993	0.986	
Satd. Flow (prot)	1835	0	0	1850	1660	0
Fl _t Permitted				0.993	0.986	
Satd. Flow (perm)	1835	0	0	1850	1660	0
Link Speed (mph)	35			45	55	
Link Distance (ft)	852			285	807	
Travel Time (s)	16.6			4.3	10.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	211	27	36	203	17	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	238	0	0	239	59	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.2%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 14: Mailman Rd & Robertson St/Knightdale Eagle Rock Rd

10/06/2022

Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	190	24	32	183	15	38
Future Vol, veh/h	190	24	32	183	15	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	211	27	36	203	17	42

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	238	0	500 225
Stage 1	-	-	-	-	225 -
Stage 2	-	-	-	-	275 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1329	-	530 814
Stage 1	-	-	-	-	812 -
Stage 2	-	-	-	-	771 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1329	-	514 814
Mov Cap-2 Maneuver	-	-	-	-	514 -
Stage 1	-	-	-	-	812 -
Stage 2	-	-	-	-	747 -

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	699	-	-	1329	-
HCM Lane V/C Ratio	0.084	-	-	0.027	-
HCM Control Delay (s)	10.6	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	11	224	183	17	29	25
Future Volume (vph)	11	224	183	17	29	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.988		0.937	
Flt Protected		0.998			0.974	
Satd. Flow (prot)	0	1859	1840	0	1700	0
Flt Permitted		0.998			0.974	
Satd. Flow (perm)	0	1859	1840	0	1700	0
Link Speed (mph)		45	45		45	
Link Distance (ft)		1096	1080		2466	
Travel Time (s)		16.6	16.4		37.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	12	249	203	19	32	28
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	261	222	0	60	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	30.7%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	11	224	183	17	29	25
Future Vol, veh/h	11	224	183	17	29	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	249	203	19	32	28

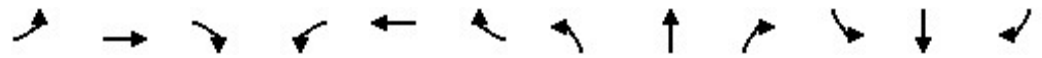
Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	222	0	-	0	486 213
Stage 1	-	-	-	-	213 -
Stage 2	-	-	-	-	273 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1347	-	-	-	540 827
Stage 1	-	-	-	-	823 -
Stage 2	-	-	-	-	773 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1347	-	-	-	535 827
Mov Cap-2 Maneuver	-	-	-	-	535 -
Stage 1	-	-	-	-	815 -
Stage 2	-	-	-	-	773 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1347	-	-	-	640
HCM Lane V/C Ratio	0.009	-	-	-	0.094
HCM Control Delay (s)	7.7	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Robertson Street Assemblage TIA
17: Smithfield Rd & First Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	272	206	14	83	312	23	11	339	36	9	416	361
Future Volume (vph)	272	206	14	83	312	23	11	339	36	9	416	361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			-2%			8%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.992			0.987			0.938	
Flt Protected		0.973			0.990			0.999			0.999	
Satd. Flow (prot)	0	1787	0	0	1848	0	0	1855	0	0	1676	0
Flt Permitted		0.534			0.817			0.972			0.994	
Satd. Flow (perm)	0	981	0	0	1525	0	0	1805	0	0	1667	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1108			1409			1184			1107	
Travel Time (s)		30.2			38.4			23.1			21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	302	229	16	92	347	26	12	377	40	10	462	401
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	547	0	0	465	0	0	429	0	0	873	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	0.99	0.99	0.99	0.99	0.99	0.99	1.05	1.05	1.05
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	72.0	72.0		72.0	72.0		68.0	68.0		68.0	68.0	
Total Split (%)	51.4%	51.4%		51.4%	51.4%		48.6%	48.6%		48.6%	48.6%	
Maximum Green (s)	67.5	67.5		67.2	67.2		62.8	62.8		62.9	62.9	
Yellow Time (s)	3.1	3.1		3.3	3.3		4.0	4.0		3.4	3.4	
All-Red Time (s)	1.4	1.4		1.5	1.5		1.2	1.2		1.7	1.7	
Lost Time Adjust (s)		0.5			0.2			-0.2			-0.1	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		67.0			67.0			63.0			63.0	
Actuated g/C Ratio		0.48			0.48			0.45			0.45	
v/c Ratio		1.17			0.64			0.53			1.16	

Robertson Street Assemblage TIA
 17: Smithfield Rd & First Ave

10/06/2022

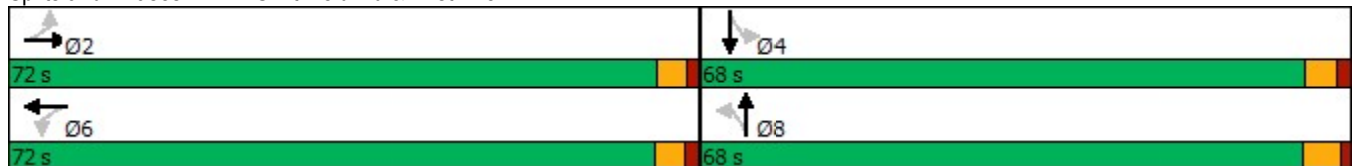


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		130.0			32.3			30.7			123.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		130.0			32.3			30.7			123.7	
LOS		F			C			C			F	
Approach Delay		130.0			32.3			30.7			123.7	
Approach LOS		F			C			C			F	
Queue Length 50th (ft)		~590			311			278			~941	
Queue Length 95th (ft)		#819			437			382			#1194	
Internal Link Dist (ft)		1028			1329			1104			1027	
Turn Bay Length (ft)												
Base Capacity (vph)		469			729			812			750	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		1.17			0.64			0.53			1.16	

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Natural Cycle:	140
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.17
Intersection Signal Delay:	89.6
Intersection LOS:	F
Intersection Capacity Utilization:	109.8%
ICU Level of Service:	H
Analysis Period (min):	15
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 17: Smithfield Rd & First Ave



MOVEMENT SUMMARY

Site: 2 [Knightdale Station Run / Carolinian Ave (Site Folder: Robertson St TIA)]

2028 Background AM Peak Hour
 Site Category: Base Year
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist ft]				
South: Carolinian Ave														
3	L2	14	2.0	16	2.0	0.142	5.9	LOS A	0.6	15.0	0.55	0.48	0.55	24.3
8	T1	69	2.0	77	2.0	0.142	5.9	LOS A	0.6	15.0	0.55	0.48	0.55	23.9
18	R2	21	2.0	23	2.0	0.142	5.9	LOS A	0.6	15.0	0.55	0.48	0.55	23.4
Approach		104	2.0	116	2.0	0.142	5.9	LOS A	0.6	15.0	0.55	0.48	0.55	23.9
East: Knightdale Station Run														
1	L2	10	2.0	11	2.0	0.339	6.2	LOS A	1.9	49.3	0.34	0.20	0.34	24.3
6	T1	117	2.0	130	2.0	0.339	6.2	LOS A	1.9	49.3	0.34	0.20	0.34	23.9
16	R2	238	2.0	264	2.0	0.339	6.2	LOS A	1.9	49.3	0.34	0.20	0.34	23.3
Approach		365	2.0	406	2.0	0.339	6.2	LOS A	1.9	49.3	0.34	0.20	0.34	23.5
North: Carolinian Ave														
7	L2	234	2.0	260	2.0	0.275	5.7	LOS A	1.4	36.3	0.37	0.23	0.37	23.6
4	T1	30	2.0	33	2.0	0.275	5.7	LOS A	1.4	36.3	0.37	0.23	0.37	23.2
14	R2	20	2.0	22	2.0	0.275	5.7	LOS A	1.4	36.3	0.37	0.23	0.37	22.7
Approach		284	2.0	316	2.0	0.275	5.7	LOS A	1.4	36.3	0.37	0.23	0.37	23.5
West: Knightdale Station Run														
5	L2	23	2.0	26	2.0	0.249	6.1	LOS A	1.2	30.2	0.49	0.39	0.49	24.3
2	T1	184	2.0	204	2.0	0.249	6.1	LOS A	1.2	30.2	0.49	0.39	0.49	24.0
12	R2	14	2.0	16	2.0	0.249	6.1	LOS A	1.2	30.2	0.49	0.39	0.49	23.4
Approach		221	2.0	246	2.0	0.249	6.1	LOS A	1.2	30.2	0.49	0.39	0.49	24.0
All Vehicles		974	2.0	1082	2.0	0.339	6.0	LOS A	1.9	49.3	0.41	0.28	0.41	23.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Knightdale Station Run / Carolinian Ave (Site Folder: Robertson St TIA)]

2028 Background PM Peak Hour
 Site Category: Base Year
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist ft]				
South: Carolinian Ave														
3	L2	21	2.0	23	2.0	0.062	3.4	LOS A	0.3	6.8	0.21	0.09	0.21	24.8
8	T1	44	2.0	49	2.0	0.062	3.4	LOS A	0.3	6.8	0.21	0.09	0.21	24.4
18	R2	4	2.0	4	2.0	0.062	3.4	LOS A	0.3	6.8	0.21	0.09	0.21	23.9
Approach		69	2.0	77	2.0	0.062	3.4	LOS A	0.3	6.8	0.21	0.09	0.21	24.5
East: Knightdale Station Run														
1	L2	4	2.0	4	2.0	0.071	3.5	LOS A	0.3	7.9	0.23	0.10	0.23	25.0
6	T1	33	2.0	37	2.0	0.071	3.5	LOS A	0.3	7.9	0.23	0.10	0.23	24.6
16	R2	42	2.0	47	2.0	0.071	3.5	LOS A	0.3	7.9	0.23	0.10	0.23	24.0
Approach		79	2.0	88	2.0	0.071	3.5	LOS A	0.3	7.9	0.23	0.10	0.23	24.3
North: Carolinian Ave														
7	L2	35	2.0	39	2.0	0.114	3.8	LOS A	0.5	13.2	0.19	0.08	0.19	24.7
4	T1	59	2.0	66	2.0	0.114	3.8	LOS A	0.5	13.2	0.19	0.08	0.19	24.3
14	R2	36	2.0	40	2.0	0.114	3.8	LOS A	0.5	13.2	0.19	0.08	0.19	23.8
Approach		130	2.0	144	2.0	0.114	3.8	LOS A	0.5	13.2	0.19	0.08	0.19	24.2
West: Knightdale Station Run														
5	L2	19	2.0	21	2.0	0.066	3.5	LOS A	0.3	7.2	0.25	0.12	0.25	24.7
2	T1	21	2.0	23	2.0	0.066	3.5	LOS A	0.3	7.2	0.25	0.12	0.25	24.3
12	R2	32	2.0	36	2.0	0.066	3.5	LOS A	0.3	7.2	0.25	0.12	0.25	23.8
Approach		72	2.0	80	2.0	0.066	3.5	LOS A	0.3	7.2	0.25	0.12	0.25	24.2
All Vehicles		350	2.0	389	2.0	0.114	3.6	LOS A	0.5	13.2	0.22	0.09	0.22	24.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

2028 Build Traffic Volumes

Robertson Street Assemblage TIA
1: Carolinian Ave & Knightdale Blvd

10/06/2022



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	13	707	165	133	1237	320	147
Future Volume (vph)	13	707	165	133	1237	320	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			3%	-1%	
Storage Length (ft)	250		225	275		275	275
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Frt			0.850				0.850
Flt Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1787	3575	1599	1743	3486	3450	1591
Flt Permitted	0.143			0.259		0.950	
Satd. Flow (perm)	269	3575	1599	475	3486	3450	1591
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	25	
Link Distance (ft)		948			1123	1095	
Travel Time (s)		14.4			17.0	29.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	14	786	183	148	1374	356	163
Shared Lane Traffic (%)							
Lane Group Flow (vph)	14	786	183	148	1374	356	163
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		12			12	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	0.99	1.02	1.02	0.99	0.99
Turning Speed (mph)	9		9	15		15	9
Turn Type	D.Pm	NA	pm+ov	D,P+P	NA	Prot	pm+ov
Protected Phases		2	8	1	6	8	1
Permitted Phases	6		2	2			8
Detector Phase	6	2	8	1	6	8	1
Switch Phase							
Minimum Initial (s)	12.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	25.0	32.1	25.0	14.0	25.0	25.0	14.0
Total Split (s)	62.0	46.0	28.0	16.0	62.0	28.0	16.0
Total Split (%)	68.9%	51.1%	31.1%	17.8%	68.9%	31.1%	17.8%
Maximum Green (s)	54.9	38.9	21.1	9.3	54.9	21.1	9.3
Yellow Time (s)	4.7	4.7	3.0	3.0	4.7	3.0	3.0
All-Red Time (s)	2.4	2.4	3.9	3.7	2.4	3.9	3.7
Lost Time Adjust (s)	-2.1	-2.1	-1.9	-1.7	-2.1	-1.9	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lag		Lead			Lead
Lead-Lag Optimize?		Yes		Yes			Yes
Vehicle Extension (s)	6.0	6.0	2.0	2.0	6.0	2.0	2.0
Minimum Gap (s)	3.0	3.0	2.0	2.0	3.0	2.0	2.0

Robertson Street Assemblage TIA
1: Carolinian Ave & Knightdale Blvd

10/06/2022



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Time Before Reduce (s)	20.0	20.0	0.0	0.0	20.0	0.0	0.0
Time To Reduce (s)	45.0	45.0	0.0	0.0	45.0	0.0	0.0
Recall Mode	Min	Min	None	None	Min	None	None
Walk Time (s)		7.0					
Flash Dont Walk (s)		18.0					
Pedestrian Calls (#/hr)		0					
Act Effct Green (s)	37.6	23.1	41.2	32.5	37.6	12.9	27.4
Actuated g/C Ratio	0.62	0.38	0.68	0.53	0.62	0.21	0.45
v/c Ratio	0.08	0.58	0.17	0.33	0.64	0.49	0.23
Control Delay	6.6	17.0	3.8	7.5	9.1	24.5	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	17.0	3.8	7.5	9.1	24.5	12.5
LOS	A	B	A	A	A	C	B
Approach Delay		14.4			8.9	20.7	
Approach LOS		B			A	C	
Queue Length 50th (ft)	2	111	18	19	137	59	36
Queue Length 95th (ft)	10	191	39	47	244	111	83
Internal Link Dist (ft)		868			1043	1015	
Turn Bay Length (ft)	250		225	275		275	275
Base Capacity (vph)	245	2470	1363	504	3179	1337	766
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.32	0.13	0.29	0.43	0.27	0.21

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 60.8

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 12.7

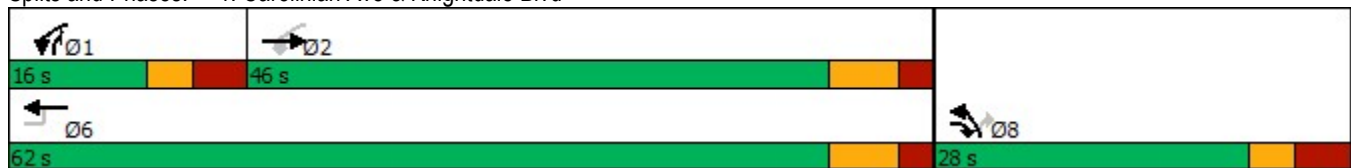
Intersection LOS: B

Intersection Capacity Utilization 65.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Carolinian Ave & Knightdale Blvd



Robertson Street Assemblage TIA
 2: Carolinian Ave & Knightdale Station Run

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	23	184	31	10	117	238	70	125	21	234	48	20
Future Volume (vph)	23	184	31	10	117	238	70	125	21	234	48	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.983			0.912			0.987			0.991	
Fl _t Protected		0.995			0.999			0.984			0.963	
Satd. Flow (prot)	0	1822	0	0	1697	0	0	1809	0	0	1778	0
Fl _t Permitted		0.995			0.999			0.984			0.963	
Satd. Flow (perm)	0	1822	0	0	1697	0	0	1809	0	0	1778	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		910			556			1007			1095	
Travel Time (s)		24.8			15.2			27.5			29.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	26	204	34	11	130	264	78	139	23	260	53	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	264	0	0	405	0	0	240	0	0	335	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.5%
ICU Level of Service	B
Analysis Period (min)	15

Robertson Street Assemblage TIA
 3: First Ave & Knightdale Station Run

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	156	47	428	174	36	280
Future Volume (vph)	156	47	428	174	36	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.961			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1790	0	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1790	0	1770	1863
Link Speed (mph)	25		35			35
Link Distance (ft)	1463		1498			771
Travel Time (s)	39.9		29.2			15.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	173	52	476	193	40	311
Shared Lane Traffic (%)						
Lane Group Flow (vph)	173	52	669	0	40	311
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.4%
	ICU Level of Service A
Analysis Period (min)	15

Robertson Street Assemblage TIA
3: First Ave & Knightdale Station Run

10/06/2022

Intersection						
Int Delay, s/veh	6.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	156	47	428	174	36	280
Future Vol, veh/h	156	47	428	174	36	280
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	173	52	476	193	40	311

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	964	573	0	0	669	0
Stage 1	573	-	-	-	-	-
Stage 2	391	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	283	519	-	-	921	-
Stage 1	564	-	-	-	-	-
Stage 2	683	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	271	519	-	-	921	-
Mov Cap-2 Maneuver	271	-	-	-	-	-
Stage 1	564	-	-	-	-	-
Stage 2	654	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	33.1	0	1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	271	519	921	-
HCM Lane V/C Ratio	-	-	0.64	0.101	0.043	-
HCM Control Delay (s)	-	-	39.2	12.7	9.1	-
HCM Lane LOS	-	-	E	B	A	-
HCM 95th %tile Q(veh)	-	-	4	0.3	0.1	-

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	6	27	40	7	32	4	131	9	10	4	5	17
Future Volume (vph)	6	27	40	7	32	4	131	9	10	4	5	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.927			0.989			0.991			0.912	
Fl _t Protected		0.996			0.992			0.958			0.993	
Satd. Flow (prot)	0	1720	0	0	1828	0	0	1768	0	0	1687	0
Fl _t Permitted		0.996			0.992			0.958			0.993	
Satd. Flow (perm)	0	1720	0	0	1828	0	0	1768	0	0	1687	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1007			1193			1169			1254	
Travel Time (s)		27.5			32.5			31.9			34.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	30	44	8	36	4	146	10	11	4	6	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	81	0	0	48	0	0	167	0	0	29	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	26.5%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	27	40	7	32	4	131	9	10	4	5	17
Future Vol, veh/h	6	27	40	7	32	4	131	9	10	4	5	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	30	44	8	36	4	146	10	11	4	6	19

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	40	0	0	74	0	0	133	122	52	131	142	38
Stage 1	-	-	-	-	-	-	66	66	-	54	54	-
Stage 2	-	-	-	-	-	-	67	56	-	77	88	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1570	-	-	1526	-	-	839	768	1016	841	749	1034
Stage 1	-	-	-	-	-	-	945	840	-	958	850	-
Stage 2	-	-	-	-	-	-	943	848	-	932	822	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1570	-	-	1526	-	-	813	760	1016	817	742	1034
Mov Cap-2 Maneuver	-	-	-	-	-	-	813	760	-	817	742	-
Stage 1	-	-	-	-	-	-	940	836	-	953	846	-
Stage 2	-	-	-	-	-	-	915	844	-	906	818	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			1.2			10.5			9		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	820	1570	-	-	1526	-	-	926
HCM Lane V/C Ratio	0.203	0.004	-	-	0.005	-	-	0.031
HCM Control Delay (s)	10.5	7.3	0	-	7.4	0	-	9
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.8	0	-	-	0	-	-	0.1

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	8	31	11	51	52	4
Future Volume (vph)	8	31	11	51	52	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.893				0.991	
Flt Protected	0.990			0.991		
Satd. Flow (prot)	1647	0	0	1846	1846	0
Flt Permitted	0.990			0.991		
Satd. Flow (perm)	1647	0	0	1846	1846	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	997			2466	1085	
Travel Time (s)	27.2			37.4	16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	34	12	57	58	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	0	69	62	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.0%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	8	31	11	51	52	4
Future Vol, veh/h	8	31	11	51	52	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	34	12	57	58	4

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	141	60	62	0	0
Stage 1	60	-	-	-	-
Stage 2	81	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	852	1005	1541	-	-
Stage 1	963	-	-	-	-
Stage 2	942	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	845	1005	1541	-	-
Mov Cap-2 Maneuver	845	-	-	-	-
Stage 1	955	-	-	-	-
Stage 2	942	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	1.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1541	-	967	-	-
HCM Lane V/C Ratio	0.008	-	0.045	-	-
HCM Control Delay (s)	7.4	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	72	446	4	18	396
Future Volume (vph)	5	72	446	4	18	396
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.874		0.999			
Flt Protected	0.997					0.998
Satd. Flow (prot)	1623	0	1861	0	0	1859
Flt Permitted	0.997					0.998
Satd. Flow (perm)	1623	0	1861	0	0	1859
Link Speed (mph)	15		35			35
Link Distance (ft)	1616		1292			1498
Travel Time (s)	73.5		25.2			29.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	80	496	4	20	440
Shared Lane Traffic (%)						
Lane Group Flow (vph)	86	0	500	0	0	460
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.9%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
6: First Ave & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	1.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	72	446	4	18	396
Future Vol, veh/h	5	72	446	4	18	396
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	80	496	4	20	440

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	978	498	0	0	500
Stage 1	498	-	-	-	-
Stage 2	480	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	278	572	-	-	1064
Stage 1	611	-	-	-	-
Stage 2	622	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	271	572	-	-	1064
Mov Cap-2 Maneuver	271	-	-	-	-
Stage 1	611	-	-	-	-
Stage 2	606	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	534	1064
HCM Lane V/C Ratio	-	-	0.16	0.019
HCM Control Delay (s)	-	-	13	8.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1

Robertson Street Assemblage TIA
7: First Ave & Robertson St

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	207	134	282	101	90	278
Future Volume (vph)	207	134	282	101	90	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.947		0.964			
Flt Protected	0.971					0.988
Satd. Flow (prot)	1713	0	1796	0	0	1840
Flt Permitted	0.971					0.988
Satd. Flow (perm)	1713	0	1796	0	0	1840
Link Speed (mph)	25		35			35
Link Distance (ft)	1195		1409			1292
Travel Time (s)	32.6		27.4			25.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	230	149	313	112	100	309
Shared Lane Traffic (%)						
Lane Group Flow (vph)	379	0	425	0	0	409
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	70.3%
Analysis Period (min)	15
	ICU Level of Service C

Robertson Street Assemblage TIA
7: First Ave & Robertson St

10/06/2022

Intersection						
Int Delay, s/veh	28.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	207	134	282	101	90	278
Future Vol, veh/h	207	134	282	101	90	278
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	230	149	313	112	100	309

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	878	369	0	0	425
Stage 1	369	-	-	-	-
Stage 2	509	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	318	677	-	-	1134
Stage 1	699	-	-	-	-
Stage 2	604	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	284	677	-	-	1134
Mov Cap-2 Maneuver	284	-	-	-	-
Stage 1	699	-	-	-	-
Stage 2	540	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	89.1	0	2.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	368	1134
HCM Lane V/C Ratio	-	-	1.03	0.088
HCM Control Delay (s)	-	-	89.1	8.5
HCM Lane LOS	-	-	F	A
HCM 95th %tile Q(veh)	-	-	12.6	0.3



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	172	278	54	31	10
Future Volume (vph)	5	172	278	54	31	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.978		0.967	
Flt Protected		0.998			0.964	
Satd. Flow (prot)	0	1859	1822	0	1736	0
Flt Permitted		0.998			0.964	
Satd. Flow (perm)	0	1859	1822	0	1736	0
Link Speed (mph)		25	25		25	
Link Distance (ft)		1195	2012		1616	
Travel Time (s)		32.6	54.9		44.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	191	309	60	34	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	197	369	0	45	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	27.9%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 8: Robertson St & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↔		↕	
Traffic Vol, veh/h	5	172	278	54	31	10
Future Vol, veh/h	5	172	278	54	31	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	191	309	60	34	11

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	369	0	-	0	542 339
Stage 1	-	-	-	-	339 -
Stage 2	-	-	-	-	203 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1190	-	-	-	501 703
Stage 1	-	-	-	-	722 -
Stage 2	-	-	-	-	831 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1190	-	-	-	498 703
Mov Cap-2 Maneuver	-	-	-	-	498 -
Stage 1	-	-	-	-	718 -
Stage 2	-	-	-	-	831 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1190	-	-	-	536
HCM Lane V/C Ratio	0.005	-	-	-	0.085
HCM Control Delay (s)	8	0	-	-	12.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Robertson Street Assemblage TIA
 9: Site Access 1/Site Access 1A & Robertson St

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	4	181	22	6	282	4	50	4	16	4	4	4
Future Volume (vph)	4	181	22	6	282	4	50	4	16	4	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.998			0.969			0.955	
Flt Protected		0.999			0.999			0.965			0.984	
Satd. Flow (prot)	0	1835	0	0	1857	0	0	1742	0	0	1750	0
Flt Permitted		0.999			0.999			0.965			0.984	
Satd. Flow (perm)	0	1835	0	0	1857	0	0	1742	0	0	1750	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2012			431			1157			209	
Travel Time (s)		39.2			8.4			31.6			5.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	201	24	7	313	4	56	4	18	4	4	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	229	0	0	324	0	0	78	0	0	12	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.6%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 9: Site Access 1/Site Access 1A & Robertson St

10/06/2022

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	181	22	6	282	4	50	4	16	4	4	4
Future Vol, veh/h	4	181	22	6	282	4	50	4	16	4	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	201	24	7	313	4	56	4	18	4	4	4

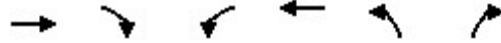
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	317	0	0	225	0	0	554	552	213	561	562	315
Stage 1	-	-	-	-	-	-	221	221	-	329	329	-
Stage 2	-	-	-	-	-	-	333	331	-	232	233	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1243	-	-	1344	-	-	443	442	827	438	436	725
Stage 1	-	-	-	-	-	-	781	720	-	684	646	-
Stage 2	-	-	-	-	-	-	681	645	-	771	712	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1243	-	-	1344	-	-	434	438	827	422	432	725
Mov Cap-2 Maneuver	-	-	-	-	-	-	434	438	-	422	432	-
Stage 1	-	-	-	-	-	-	778	717	-	681	642	-
Stage 2	-	-	-	-	-	-	668	641	-	747	709	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.2			13.8			12.5		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	487	1243	-	-	1344	-	-	495
HCM Lane V/C Ratio	0.16	0.004	-	-	0.005	-	-	0.027
HCM Control Delay (s)	13.8	7.9	0	-	7.7	0	-	12.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.1

Robertson Street Assemblage TIA
 10: Site Access 2 & Robertson St

10/06/2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	194	4	5	280	8	17
Future Volume (vph)	194	4	5	280	8	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.998			0.908		
Fl _t Protected				0.999	0.984	
Satd. Flow (prot)	1859	0	0	1861	1664	0
Fl _t Permitted				0.999	0.984	
Satd. Flow (perm)	1859	0	0	1861	1664	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	431			605	752	
Travel Time (s)	8.4			11.8	20.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	216	4	6	311	9	19
Shared Lane Traffic (%)						
Lane Group Flow (vph)	220	0	0	317	28	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.7%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 10: Site Access 2 & Robertson St

10/06/2022

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	194	4	5	280	8	17
Future Vol, veh/h	194	4	5	280	8	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	216	4	6	311	9	19

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	220	0	541
Stage 1	-	-	-	-	218
Stage 2	-	-	-	-	323
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1349	-	502
Stage 1	-	-	-	-	818
Stage 2	-	-	-	-	734
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1349	-	499
Mov Cap-2 Maneuver	-	-	-	-	499
Stage 1	-	-	-	-	818
Stage 2	-	-	-	-	730

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	681	-	-	1349	-
HCM Lane V/C Ratio	0.041	-	-	0.004	-
HCM Control Delay (s)	10.5	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Robertson Street Assemblage TIA
 11: Site Access 3 & Robertson St

10/06/2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	204	7	11	242	43	34
Future Volume (vph)	204	7	11	242	43	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.995			0.940		
Flt Protected				0.998	0.973	
Satd. Flow (prot)	1853	0	0	1859	1704	0
Flt Permitted				0.998	0.973	
Satd. Flow (perm)	1853	0	0	1859	1704	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	605			535	566	
Travel Time (s)	11.8			10.4	15.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	227	8	12	269	48	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	235	0	0	281	86	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.8%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 11: Site Access 3 & Robertson St

10/06/2022

Intersection						
Int Delay, s/veh	1.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	204	7	11	242	43	34
Future Vol, veh/h	204	7	11	242	43	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	227	8	12	269	48	38

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	235	0	524 231
Stage 1	-	-	-	-	231 -
Stage 2	-	-	-	-	293 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1332	-	514 808
Stage 1	-	-	-	-	807 -
Stage 2	-	-	-	-	757 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1332	-	508 808
Mov Cap-2 Maneuver	-	-	-	-	508 -
Stage 1	-	-	-	-	807 -
Stage 2	-	-	-	-	749 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	608	-	-	1332	-
HCM Lane V/C Ratio	0.141	-	-	0.009	-
HCM Control Delay (s)	11.9	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Robertson Street Assemblage TIA
 12: Robertson St & Site Access 4

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	12	226	245	5	4	8
Future Volume (vph)	12	226	245	5	4	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.997		0.907	
Flt Protected		0.998			0.985	
Satd. Flow (prot)	0	1859	1857	0	1664	0
Flt Permitted		0.998			0.985	
Satd. Flow (perm)	0	1859	1857	0	1664	0
Link Speed (mph)		35	35		10	
Link Distance (ft)		535	213		253	
Travel Time (s)		10.4	4.1		17.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	251	272	6	4	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	264	278	0	13	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	31.7%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 12: Robertson St & Site Access 4

10/06/2022

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	12	226	245	5	4	8
Future Vol, veh/h	12	226	245	5	4	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	251	272	6	4	9

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	278	0	-	0	552 275
Stage 1	-	-	-	-	275 -
Stage 2	-	-	-	-	277 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1285	-	-	-	495 764
Stage 1	-	-	-	-	771 -
Stage 2	-	-	-	-	770 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1285	-	-	-	489 764
Mov Cap-2 Maneuver	-	-	-	-	489 -
Stage 1	-	-	-	-	762 -
Stage 2	-	-	-	-	770 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1285	-	-	-	643
HCM Lane V/C Ratio	0.01	-	-	-	0.021
HCM Control Delay (s)	7.8	0	-	-	10.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Robertson Street Assemblage TIA
 13: Robertson St & Site Access 5

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↔		↕	
Traffic Volume (vph)	12	217	242	8	5	8
Future Volume (vph)	12	217	242	8	5	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.996		0.919	
Flt Protected		0.997			0.980	
Satd. Flow (prot)	0	1857	1855	0	1678	0
Flt Permitted		0.997			0.980	
Satd. Flow (perm)	0	1857	1855	0	1678	0
Link Speed (mph)		35	35		10	
Link Distance (ft)		213	852		269	
Travel Time (s)		4.1	16.6		18.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	241	269	9	6	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	254	278	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	31.2%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 13: Robertson St & Site Access 5

10/06/2022

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	12	217	242	8	5	8
Future Vol, veh/h	12	217	242	8	5	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	241	269	9	6	9

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	278	0	-	0	541
Stage 1	-	-	-	-	274
Stage 2	-	-	-	-	267
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1285	-	-	-	502
Stage 1	-	-	-	-	772
Stage 2	-	-	-	-	778
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1285	-	-	-	496
Mov Cap-2 Maneuver	-	-	-	-	496
Stage 1	-	-	-	-	763
Stage 2	-	-	-	-	778

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1285	-	-	-	633
HCM Lane V/C Ratio	0.01	-	-	-	0.023
HCM Control Delay (s)	7.8	0	-	-	10.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Robertson Street Assemblage TIA

14: Mailman Rd/Site Access 6 & Robertson St/Knightdale Eagle Rock Rd

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	12	191	23	31	206	8	25	4	26	5	4	8
Future Volume (vph)	12	191	23	31	206	8	25	4	26	5	4	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.986			0.996			0.936			0.936	
Fl _t Protected		0.997			0.994			0.978			0.984	
Satd. Flow (prot)	0	1831	0	0	1844	0	0	1705	0	0	1716	0
Fl _t Permitted		0.997			0.994			0.978			0.984	
Satd. Flow (perm)	0	1831	0	0	1844	0	0	1705	0	0	1716	0
Link Speed (mph)		35			45			55			10	
Link Distance (ft)		852			285			807			349	
Travel Time (s)		16.6			4.3			10.0			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	212	26	34	229	9	28	4	29	6	4	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	251	0	0	272	0	0	61	0	0	19	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	34.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	191	23	31	206	8	25	4	26	5	4	8
Future Vol, veh/h	12	191	23	31	206	8	25	4	26	5	4	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	212	26	34	229	9	28	4	29	6	4	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	238	0	0	238	0	0	559	557	225	570	566	234
Stage 1	-	-	-	-	-	-	251	251	-	302	302	-
Stage 2	-	-	-	-	-	-	308	306	-	268	264	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1329	-	-	1329	-	-	440	439	814	432	434	805
Stage 1	-	-	-	-	-	-	753	699	-	707	664	-
Stage 2	-	-	-	-	-	-	702	662	-	738	690	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1329	-	-	1329	-	-	418	421	814	400	416	805
Mov Cap-2 Maneuver	-	-	-	-	-	-	418	421	-	400	416	-
Stage 1	-	-	-	-	-	-	745	691	-	699	644	-
Stage 2	-	-	-	-	-	-	669	642	-	699	682	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	1	12.5	12
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	543	1329	-	-	1329	-	-	530
HCM Lane V/C Ratio	0.113	0.01	-	-	0.026	-	-	0.036
HCM Control Delay (s)	12.5	7.7	0	-	7.8	0	-	12
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0.1	-	-	0.1

Robertson Street Assemblage TIA
 15: Knightdale Eagle Rock Rd & Site Access 7

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	205	249	8	5	6
Future Volume (vph)	13	205	249	8	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.996		0.927	
Flt Protected		0.997			0.977	
Satd. Flow (prot)	0	1857	1855	0	1687	0
Flt Permitted		0.997			0.977	
Satd. Flow (perm)	0	1857	1855	0	1687	0
Link Speed (mph)		45	45		10	
Link Distance (ft)		285	1096		338	
Travel Time (s)		4.3	16.6		23.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	14	228	277	9	6	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	242	286	0	13	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Stop	Stop		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	31.4%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	39	171	214	16	35	43
Future Volume (vph)	39	171	214	16	35	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.991		0.926	
Flt Protected		0.991			0.978	
Satd. Flow (prot)	0	1846	1846	0	1687	0
Flt Permitted		0.991			0.978	
Satd. Flow (perm)	0	1846	1846	0	1687	0
Link Speed (mph)		45	45		45	
Link Distance (ft)		1096	1080		2466	
Travel Time (s)		16.6	16.4		37.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	43	190	238	18	39	48
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	233	256	0	87	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	38.0%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022

Intersection

Int Delay, s/veh 2.4

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	39	171	214	16	35	43
Future Vol, veh/h	39	171	214	16	35	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	190	238	18	39	48

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	256	0	-	0	523	247
Stage 1	-	-	-	-	247	-
Stage 2	-	-	-	-	276	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1309	-	-	-	514	792
Stage 1	-	-	-	-	794	-
Stage 2	-	-	-	-	771	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1309	-	-	-	495	792
Mov Cap-2 Maneuver	-	-	-	-	495	-
Stage 1	-	-	-	-	765	-
Stage 2	-	-	-	-	771	-

Approach EB WB SB

HCM Control Delay, s	1.5	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	1309	-	-	-	624
HCM Lane V/C Ratio	0.033	-	-	-	0.139
HCM Control Delay (s)	7.8	0	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Robertson Street Assemblage TIA
17: Smithfield Rd & First Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	265	206	4	82	234	75	10	330	75	30	196	155
Future Volume (vph)	265	206	4	82	234	75	10	330	75	30	196	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			-2%			8%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.974			0.976			0.945	
Flt Protected		0.973			0.990			0.999			0.996	
Satd. Flow (prot)	0	1793	0	0	1814	0	0	1834	0	0	1683	0
Flt Permitted		0.608			0.828			0.988			0.930	
Satd. Flow (perm)	0	1120	0	0	1517	0	0	1814	0	0	1572	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1108			1409			1184			1107	
Travel Time (s)		30.2			38.4			23.1			21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	294	229	4	91	260	83	11	367	83	33	218	172
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	527	0	0	434	0	0	461	0	0	423	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	0.99	0.99	0.99	0.99	0.99	0.99	1.05	1.05	1.05
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	40.0	40.0		40.0	40.0		25.0	25.0		25.0	25.0	
Total Split (%)	61.5%	61.5%		61.5%	61.5%		38.5%	38.5%		38.5%	38.5%	
Maximum Green (s)	35.5	35.5		35.2	35.2		19.8	19.8		19.9	19.9	
Yellow Time (s)	3.1	3.1		3.3	3.3		4.0	4.0		3.4	3.4	
All-Red Time (s)	1.4	1.4		1.5	1.5		1.2	1.2		1.7	1.7	
Lost Time Adjust (s)		0.5			0.2			-0.2			-0.1	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		30.9			30.9			18.5			18.5	
Actuated g/C Ratio		0.52			0.52			0.31			0.31	
v/c Ratio		0.91			0.55			0.82			0.87	

Robertson Street Assemblage TIA
 17: Smithfield Rd & First Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		36.8			13.1			34.6			41.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		36.8			13.1			34.6			41.8	
LOS		D			B			C			D	
Approach Delay		36.8			13.1			34.6			41.8	
Approach LOS		D			B			C			D	
Queue Length 50th (ft)		166			101			168			157	
Queue Length 95th (ft)		#361			175			#316			#310	
Internal Link Dist (ft)		1028			1329			1104			1027	
Turn Bay Length (ft)												
Base Capacity (vph)		674			913			624			540	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.78			0.48			0.74			0.78	

Intersection Summary

Area Type:	Other
Cycle Length:	65
Actuated Cycle Length:	59.7
Natural Cycle:	65
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.91
Intersection Signal Delay:	31.8
Intersection LOS:	C
Intersection Capacity Utilization:	95.2%
ICU Level of Service:	F
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 17: Smithfield Rd & First Ave



Robertson Street Assemblage TIA
1: Carolinian Ave & Knightdale Blvd

10/06/2022



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	26	1680	159	62	996	132	57
Future Volume (vph)	26	1680	159	62	996	132	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12
Grade (%)		-2%			3%	-1%	
Storage Length (ft)	250		225	275		275	275
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor							
Frt			0.850				0.850
Flt Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1787	3575	1599	1743	3486	3450	1591
Flt Permitted	0.238			0.087		0.950	
Satd. Flow (perm)	448	3575	1599	160	3486	3450	1591
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	25	
Link Distance (ft)		948			1123	1095	
Travel Time (s)		14.4			17.0	29.9	
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%			0%	0%	
Adj. Flow (vph)	29	1867	177	69	1107	147	63
Shared Lane Traffic (%)							
Lane Group Flow (vph)	29	1867	177	69	1107	147	63
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		12			12	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	0.99	1.02	1.02	0.99	0.99
Turning Speed (mph)	9		9	15		15	9
Turn Type	D.Pm	NA	pm+ov	D.P+P	NA	Prot	pm+ov
Protected Phases		2	8	1	6	8	1
Permitted Phases	6		2	2			8
Detector Phase	6	2	8	1	6	8	1
Switch Phase							
Minimum Initial (s)	12.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	25.0	32.1	25.0	14.0	25.0	25.0	14.0
Total Split (s)	65.0	51.0	25.0	14.0	65.0	25.0	14.0
Total Split (%)	72.2%	56.7%	27.8%	15.6%	72.2%	27.8%	15.6%

Robertson Street Assemblage TIA
 1: Carolinian Ave & Knightdale Blvd

10/06/2022

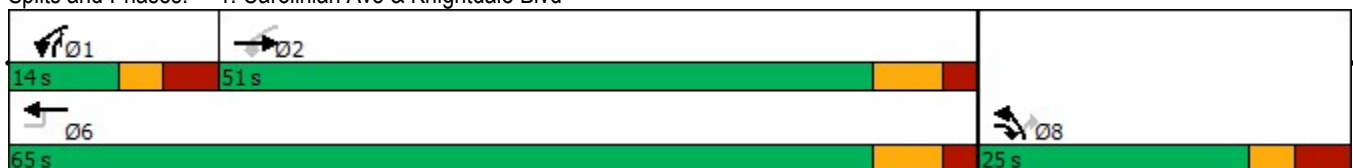


Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Maximum Green (s)	57.9	43.9	18.1	7.3	57.9	18.1	7.3
Yellow Time (s)	4.7	4.7	3.0	3.0	4.7	3.0	3.0
All-Red Time (s)	2.4	2.4	3.9	3.7	2.4	3.9	3.7
Lost Time Adjust (s)	-2.1	-2.1	-1.9	-1.7	-2.1	-1.9	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lag		Lead			Lead
Lead-Lag Optimize?		Yes		Yes			Yes
Vehicle Extension (s)	6.0	6.0	2.0	2.0	6.0	2.0	2.0
Minimum Gap (s)	3.0	3.0	2.0	2.0	3.0	2.0	2.0
Time Before Reduce (s)	20.0	20.0	0.0	0.0	20.0	0.0	0.0
Time To Reduce (s)	45.0	45.0	0.0	0.0	45.0	0.0	0.0
Recall Mode	Min	Min	None	None	Min	None	None
Walk Time (s)		7.0					
Flash Dont Walk (s)		18.0					
Pedestrian Calls (#/hr)		0					
Act Effct Green (s)	57.2	46.6	62.8	53.3	57.2	10.0	23.8
Actuated g/C Ratio	0.74	0.60	0.81	0.69	0.74	0.13	0.31
v/c Ratio	0.09	0.87	0.14	0.24	0.43	0.33	0.13
Control Delay	3.7	20.0	2.6	5.5	4.5	33.6	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	20.0	2.6	5.5	4.5	33.6	21.3
LOS	A	B	A	A	A	C	C
Approach Delay		18.3			4.5	29.9	
Approach LOS		B			A	C	
Queue Length 50th (ft)	3	390	18	7	81	35	23
Queue Length 95th (ft)	11	#624	31	18	125	61	51
Internal Link Dist (ft)		868			1043	1015	
Turn Bay Length (ft)	250		225	275		275	275
Base Capacity (vph)	349	2156	1455	296	2723	898	496
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.87	0.12	0.23	0.41	0.16	0.13

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 77.2
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 14.3
 Intersection LOS: B
 Intersection Capacity Utilization 65.7%
 ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Carolinian Ave & Knightdale Blvd



Robertson Street Assemblage TIA
 2: Carolinian Ave & Knightdale Station Run

10/06/2022














Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	19	21	95	4	33	42	58	81	4	35	118	36
Future Volume (vph)	19	21	95	4	33	42	58	81	4	35	118	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.905			0.928			0.997			0.974	
Flt Protected		0.993			0.998			0.980			0.991	
Satd. Flow (prot)	0	1674	0	0	1725	0	0	1820	0	0	1798	0
Flt Permitted		0.993			0.998			0.980			0.991	
Satd. Flow (perm)	0	1674	0	0	1725	0	0	1820	0	0	1798	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		910			556			1007			1095	
Travel Time (s)		24.8			15.2			27.5			29.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	21	23	106	4	37	47	64	90	4	39	131	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	150	0	0	88	0	0	158	0	0	210	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.3%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 3: First Ave & Knightdale Station Run

10/06/2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	95	58	427	125	104	479
Future Volume (vph)	95	58	427	125	104	479
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	150		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.969			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1805	0	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1805	0	1770	1863
Link Speed (mph)	25		35			35
Link Distance (ft)	1463		1498			771
Travel Time (s)	39.9		29.2			15.0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	106	64	474	139	116	532
Shared Lane Traffic (%)						
Lane Group Flow (vph)	106	64	613	0	116	532
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.1%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 3: First Ave & Knightdale Station Run

10/06/2022

Intersection						
Int Delay, s/veh	6.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	95	58	427	125	104	479
Future Vol, veh/h	95	58	427	125	104	479
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	106	64	474	139	116	532

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1308	544	0	0	613
Stage 1	544	-	-	-	-
Stage 2	764	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	176	539	-	-	966
Stage 1	582	-	-	-	-
Stage 2	460	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	155	539	-	-	966
Mov Cap-2 Maneuver	155	-	-	-	-
Stage 1	582	-	-	-	-
Stage 2	405	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	46.5	0	1.6
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	155	539	966
HCM Lane V/C Ratio	-	-	0.681	0.12	0.12
HCM Control Delay (s)	-	-	67.2	12.6	9.2
HCM Lane LOS	-	-	F	B	A
HCM 95th %tile Q(veh)	-	-	3.9	0.4	0.4

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	11	41	129	11	21	4	91	7	7	4	9	21
Future Volume (vph)	11	41	129	11	21	4	91	7	7	4	9	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Fr _t		0.904			0.986			0.991			0.916	
Fl _t Protected		0.997			0.985			0.959			0.995	
Satd. Flow (prot)	0	1679	0	0	1809	0	0	1770	0	0	1698	0
Fl _t Permitted		0.997			0.985			0.959			0.995	
Satd. Flow (perm)	0	1679	0	0	1809	0	0	1770	0	0	1698	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1007			1193			1169			1254	
Travel Time (s)		27.5			32.5			31.9			34.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	12	46	143	12	23	4	101	8	8	4	10	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	201	0	0	39	0	0	117	0	0	37	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	30.3%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022

Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	41	129	11	21	4	91	7	7	4	9	21
Future Vol, veh/h	11	41	129	11	21	4	91	7	7	4	9	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	46	143	12	23	4	101	8	8	4	10	23

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	27	0	0	189	0	0	208	193	118	199	262	25
Stage 1	-	-	-	-	-	-	142	142	-	49	49	-
Stage 2	-	-	-	-	-	-	66	51	-	150	213	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1587	-	-	1385	-	-	749	702	934	760	643	1051
Stage 1	-	-	-	-	-	-	861	779	-	964	854	-
Stage 2	-	-	-	-	-	-	945	852	-	853	726	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1587	-	-	1385	-	-	714	689	934	737	631	1051
Mov Cap-2 Maneuver	-	-	-	-	-	-	714	689	-	737	631	-
Stage 1	-	-	-	-	-	-	853	772	-	955	846	-
Stage 2	-	-	-	-	-	-	905	844	-	830	719	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0.4		2.3		10.9		9.4	
HCM LOS					B		A	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	724	1587	-	-	1385	-	-	857
HCM Lane V/C Ratio	0.161	0.008	-	-	0.009	-	-	0.044
HCM Control Delay (s)	10.9	7.3	0	-	7.6	0	-	9.4
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.1

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	9	16	29	49	68	14
Future Volume (vph)	9	16	29	49	68	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.913				0.977	
Flt Protected	0.982			0.982		
Satd. Flow (prot)	1670	0	0	1829	1820	0
Flt Permitted	0.982			0.982		
Satd. Flow (perm)	1670	0	0	1829	1820	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	997			2466	1085	
Travel Time (s)	27.2			37.4	16.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	10	18	32	54	76	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	0	0	86	92	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.8%
	ICU Level of Service A
Analysis Period (min)	15

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	16	29	49	68	14
Future Vol, veh/h	9	16	29	49	68	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	18	32	54	76	16

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	202	84	92	0	0
Stage 1	84	-	-	-	-
Stage 2	118	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	787	975	1503	-	-
Stage 1	939	-	-	-	-
Stage 2	907	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	770	975	1503	-	-
Mov Cap-2 Maneuver	770	-	-	-	-
Stage 1	918	-	-	-	-
Stage 2	907	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	2.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1503	-	890	-	-
HCM Lane V/C Ratio	0.021	-	0.031	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Robertson Street Assemblage TIA
6: First Ave & Keith St

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	19	26	432	12	34	440
Future Volume (vph)	19	26	432	12	34	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.922		0.996			
Flt Protected	0.979					0.996
Satd. Flow (prot)	1681	0	1855	0	0	1855
Flt Permitted	0.979					0.996
Satd. Flow (perm)	1681	0	1855	0	0	1855
Link Speed (mph)	15		35			35
Link Distance (ft)	1616		1292			1498
Travel Time (s)	73.5		25.2			29.2
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	21	29	480	13	38	489
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	493	0	0	527
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.2%
ICU Level of Service	B
Analysis Period (min)	15

Robertson Street Assemblage TIA
6: First Ave & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Vol, veh/h	19	26	432	12	34	440
Future Vol, veh/h	19	26	432	12	34	440
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	29	480	13	38	489

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1052	487	0	0	493
Stage 1	487	-	-	-	-
Stage 2	565	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	251	581	-	-	1071
Stage 1	618	-	-	-	-
Stage 2	569	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	239	581	-	-	1071
Mov Cap-2 Maneuver	239	-	-	-	-
Stage 1	618	-	-	-	-
Stage 2	541	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	362	1071
HCM Lane V/C Ratio	-	-	0.138	0.035
HCM Control Delay (s)	-	-	16.5	8.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1

Robertson Street Assemblage TIA
7: First Ave & Robertson St

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	179	122	284	261	166	337
Future Volume (vph)	179	122	284	261	166	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.945		0.935			
Flt Protected	0.971					0.984
Satd. Flow (prot)	1709	0	1742	0	0	1833
Flt Permitted	0.971					0.984
Satd. Flow (perm)	1709	0	1742	0	0	1833
Link Speed (mph)	25		35			35
Link Distance (ft)	1195		1409			1292
Travel Time (s)	32.6		27.4			25.2
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	199	136	316	290	184	374
Shared Lane Traffic (%)						
Lane Group Flow (vph)	335	0	606	0	0	558
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	85.2%
ICU Level of Service	E
Analysis Period (min)	15

Robertson Street Assemblage TIA
7: First Ave & Robertson St

10/06/2022

Intersection						
Int Delay, s/veh	65.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	179	122	284	261	166	337
Future Vol, veh/h	179	122	284	261	166	337
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	199	136	316	290	184	374

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1203	461	0	0	606	0
Stage 1	461	-	-	-	-	-
Stage 2	742	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	204	600	-	-	972	-
Stage 1	635	-	-	-	-	-
Stage 2	471	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 155	600	-	-	972	-
Mov Cap-2 Maneuver	~ 155	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	358	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	290	0	3.2
HCM LOS	F		

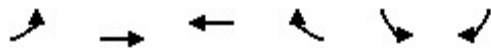
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	222	972
HCM Lane V/C Ratio	-	-	1.507	0.19
HCM Control Delay (s)	-	-	290	9.6
HCM Lane LOS	-	-	F	A
HCM 95th %tile Q(veh)	-	-	20.2	0.7

Notes
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Robertson Street Assemblage TIA

8: Robertson St & Keith St

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	15	352	288	40	38	12
Future Volume (vph)	15	352	288	40	38	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.984		0.968	
Flt Protected		0.998			0.963	
Satd. Flow (prot)	0	1859	1833	0	1736	0
Flt Permitted		0.998			0.963	
Satd. Flow (perm)	0	1859	1833	0	1736	0
Link Speed (mph)		25	25		25	
Link Distance (ft)		1195	2012		1616	
Travel Time (s)		32.6	54.9		44.1	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	17	391	320	44	42	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	408	364	0	55	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.7%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 8: Robertson St & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	15	352	288	40	38	12
Future Vol, veh/h	15	352	288	40	38	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	391	320	44	42	13

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	364	0	-	0	767 342
Stage 1	-	-	-	-	342 -
Stage 2	-	-	-	-	425 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1195	-	-	-	370 701
Stage 1	-	-	-	-	719 -
Stage 2	-	-	-	-	659 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1195	-	-	-	363 701
Mov Cap-2 Maneuver	-	-	-	-	363 -
Stage 1	-	-	-	-	706 -
Stage 2	-	-	-	-	659 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	15.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1195	-	-	-	411
HCM Lane V/C Ratio	0.014	-	-	-	0.135
HCM Control Delay (s)	8.1	0	-	-	15.1
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.5

Robertson Street Assemblage TIA
 9: Site Access 1/Site Access 1A & Robertson St

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	4	317	73	19	296	4	32	4	10	4	4	4
Future Volume (vph)	4	317	73	19	296	4	32	4	10	4	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Fr _t		0.975			0.998			0.971			0.955	
Fl _t Protected					0.997			0.966			0.984	
Satd. Flow (prot)	0	1816	0	0	1853	0	0	1747	0	0	1750	0
Fl _t Permitted					0.997			0.966			0.984	
Satd. Flow (perm)	0	1816	0	0	1853	0	0	1747	0	0	1750	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2012			431			1157			209	
Travel Time (s)		39.2			8.4			31.6			5.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	4	352	81	21	329	4	36	4	11	4	4	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	437	0	0	354	0	0	51	0	0	12	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.6%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 9: Site Access 1/Site Access 1A & Robertson St

10/06/2022

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	317	73	19	296	4	32	4	10	4	4	4
Future Vol, veh/h	4	317	73	19	296	4	32	4	10	4	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	352	81	21	329	4	36	4	11	4	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	333	0	0	433	0	0	778	776	393	781	814	331
Stage 1	-	-	-	-	-	-	401	401	-	373	373	-
Stage 2	-	-	-	-	-	-	377	375	-	408	441	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1226	-	-	1127	-	-	314	328	656	312	312	711
Stage 1	-	-	-	-	-	-	626	601	-	648	618	-
Stage 2	-	-	-	-	-	-	644	617	-	620	577	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1226	-	-	1127	-	-	302	319	656	297	304	711
Mov Cap-2 Maneuver	-	-	-	-	-	-	302	319	-	297	304	-
Stage 1	-	-	-	-	-	-	623	599	-	645	604	-
Stage 2	-	-	-	-	-	-	621	603	-	603	575	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.5			17.3			15		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	344	1226	-	-	1127	-	-	372
HCM Lane V/C Ratio	0.149	0.004	-	-	0.019	-	-	0.036
HCM Control Delay (s)	17.3	7.9	0	-	8.3	0	-	15
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.1

Robertson Street Assemblage TIA
 10: Site Access 2 & Robertson St

10/06/2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	318	9	18	310	5	11
Future Volume (vph)	318	9	18	310	5	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)			100		100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.996				0.910	
Flt Protected				0.997	0.984	
Satd. Flow (prot)	1855	0	0	1857	1668	0
Flt Permitted				0.997	0.984	
Satd. Flow (perm)	1855	0	0	1857	1668	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	431			605	752	
Travel Time (s)	8.4			11.8	20.5	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	353	10	20	344	6	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	363	0	0	364	18	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.0%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 10: Site Access 2 & Robertson St

10/06/2022

Intersection						
Int Delay, s/veh	0.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	318	9	18	310	5	11
Future Vol, veh/h	318	9	18	310	5	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	353	10	20	344	6	12

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	363	0	742
Stage 1	-	-	-	-	358
Stage 2	-	-	-	-	384
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1196	-	383
Stage 1	-	-	-	-	707
Stage 2	-	-	-	-	688
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1196	-	375
Mov Cap-2 Maneuver	-	-	-	-	375
Stage 1	-	-	-	-	707
Stage 2	-	-	-	-	674

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	545	-	-	1196	-
HCM Lane V/C Ratio	0.033	-	-	0.017	-
HCM Control Delay (s)	11.8	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Robertson Street Assemblage TIA
 11: Site Access 3 & Robertson St

10/06/2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	302	27	36	301	27	21
Future Volume (vph)	302	27	36	301	27	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)			100		100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.989				0.941	
Flt Protected				0.995	0.972	
Satd. Flow (prot)	1842	0	0	1853	1704	0
Flt Permitted				0.995	0.972	
Satd. Flow (perm)	1842	0	0	1853	1704	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	605			535	566	
Travel Time (s)	11.8			10.4	15.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	336	30	40	334	30	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	366	0	0	374	53	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.7%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 11: Site Access 3 & Robertson St

10/06/2022

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	302	27	36	301	27	21
Future Vol, veh/h	302	27	36	301	27	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	336	30	40	334	30	23

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	366	0	765 351
Stage 1	-	-	-	-	351 -
Stage 2	-	-	-	-	414 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1193	-	371 692
Stage 1	-	-	-	-	713 -
Stage 2	-	-	-	-	667 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1193	-	356 692
Mov Cap-2 Maneuver	-	-	-	-	356 -
Stage 1	-	-	-	-	713 -
Stage 2	-	-	-	-	640 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	14
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	452	-	-	1193	-
HCM Lane V/C Ratio	0.118	-	-	0.034	-
HCM Control Delay (s)	14	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Robertson Street Assemblage TIA
 12: Robertson St & Site Access 4

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	12	311	318	4	4	18
Future Volume (vph)	12	311	318	4	4	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.887	
Flt Protected		0.998			0.992	
Satd. Flow (prot)	0	1859	1859	0	1639	0
Flt Permitted		0.998			0.992	
Satd. Flow (perm)	0	1859	1859	0	1639	0
Link Speed (mph)		35	35		10	
Link Distance (ft)		535	213		253	
Travel Time (s)		10.4	4.1		17.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	13	346	353	4	4	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	359	357	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.1%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 12: Robertson St & Site Access 4

10/06/2022

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	12	311	318	4	4	18
Future Vol, veh/h	12	311	318	4	4	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	346	353	4	4	20

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	357	0	-	0	727 355
Stage 1	-	-	-	-	355 -
Stage 2	-	-	-	-	372 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1202	-	-	-	391 689
Stage 1	-	-	-	-	710 -
Stage 2	-	-	-	-	697 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1202	-	-	-	386 689
Mov Cap-2 Maneuver	-	-	-	-	386 -
Stage 1	-	-	-	-	701 -
Stage 2	-	-	-	-	697 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1202	-	-	-	603
HCM Lane V/C Ratio	0.011	-	-	-	0.041
HCM Control Delay (s)	8	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Robertson Street Assemblage TIA
 13: Robertson St & Site Access 5

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	12	309	303	8	14	19
Future Volume (vph)	12	309	303	8	14	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.923	
Flt Protected		0.998			0.979	
Satd. Flow (prot)	0	1859	1855	0	1683	0
Flt Permitted		0.998			0.979	
Satd. Flow (perm)	0	1859	1855	0	1683	0
Link Speed (mph)		35	35		10	
Link Distance (ft)		213	852		269	
Travel Time (s)		4.1	16.6		18.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	13	343	337	9	16	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	356	346	0	37	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.0%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 13: Robertson St & Site Access 5

10/06/2022

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	12	309	303	8	14	19
Future Vol, veh/h	12	309	303	8	14	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	343	337	9	16	21

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	346	0	0	711	342
Stage 1	-	-	-	342	-
Stage 2	-	-	-	369	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1213	-	-	400	701
Stage 1	-	-	-	719	-
Stage 2	-	-	-	699	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1213	-	-	395	701
Mov Cap-2 Maneuver	-	-	-	395	-
Stage 1	-	-	-	710	-
Stage 2	-	-	-	699	-

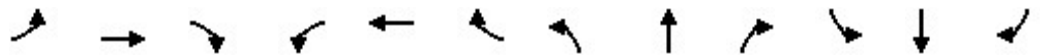
Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1213	-	-	-	528
HCM Lane V/C Ratio	0.011	-	-	-	0.069
HCM Control Delay (s)	8	0	-	-	12.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Robertson Street Assemblage TIA

14: Mailman Rd/Site Access 6 & Robertson St/Knightdale Eagle Rock Rd

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	11	261	29	37	272	9	24	4	47	13	6	20
Future Volume (vph)	11	261	29	37	272	9	24	4	47	13	6	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987			0.996			0.915			0.931	
Flt Protected		0.998			0.994			0.984			0.984	
Satd. Flow (prot)	0	1835	0	0	1844	0	0	1677	0	0	1706	0
Flt Permitted		0.998			0.994			0.984			0.984	
Satd. Flow (perm)	0	1835	0	0	1844	0	0	1677	0	0	1706	0
Link Speed (mph)		35			45			55			10	
Link Distance (ft)		852			285			807			349	
Travel Time (s)		16.6			4.3			10.0			23.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	12	290	32	41	302	10	27	4	52	14	7	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	334	0	0	353	0	0	83	0	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	43.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	261	29	37	272	9	24	4	47	13	6	20
Future Vol, veh/h	11	261	29	37	272	9	24	4	47	13	6	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	290	32	41	302	10	27	4	52	14	7	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	312	0	0	322	0	0	734	724	306	747	735	307
Stage 1	-	-	-	-	-	-	330	330	-	389	389	-
Stage 2	-	-	-	-	-	-	404	394	-	358	346	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1248	-	-	1238	-	-	336	352	734	329	347	733
Stage 1	-	-	-	-	-	-	683	646	-	635	608	-
Stage 2	-	-	-	-	-	-	623	605	-	660	635	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1248	-	-	1238	-	-	308	334	734	291	329	733
Mov Cap-2 Maneuver	-	-	-	-	-	-	308	334	-	291	329	-
Stage 1	-	-	-	-	-	-	675	638	-	627	584	-
Stage 2	-	-	-	-	-	-	573	581	-	601	627	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.9			13.9			14.3		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	487	1248	-	-	1238	-	-	432
HCM Lane V/C Ratio	0.171	0.01	-	-	0.033	-	-	0.1
HCM Control Delay (s)	13.9	7.9	0	-	8	0	-	14.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0.1	-	-	0.3

Robertson Street Assemblage TIA
 15: Knightdale Eagle Rock Rd & Site Access 7

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	11	317	292	9	13	19
Future Volume (vph)	11	317	292	9	13	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.919	
Flt Protected		0.998			0.980	
Satd. Flow (prot)	0	1859	1855	0	1678	0
Flt Permitted		0.998			0.980	
Satd. Flow (perm)	0	1859	1855	0	1678	0
Link Speed (mph)		45	45		10	
Link Distance (ft)		285	1096		338	
Travel Time (s)		4.3	16.6		23.0	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	12	352	324	10	14	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	364	334	0	35	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Stop	Stop		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.6%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	51	279	243	26	34	58
Future Volume (vph)	51	279	243	26	34	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.987		0.915	
Flt Protected		0.992			0.982	
Satd. Flow (prot)	0	1848	1839	0	1674	0
Flt Permitted		0.992			0.982	
Satd. Flow (perm)	0	1848	1839	0	1674	0
Link Speed (mph)		45	45		45	
Link Distance (ft)		1096	1080		2466	
Travel Time (s)		16.6	16.4		37.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	57	310	270	29	38	64
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	367	299	0	102	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.3%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	51	279	243	26	34	58
Future Vol, veh/h	51	279	243	26	34	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	310	270	29	38	64

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	299	0	0	709	285
Stage 1	-	-	-	285	-
Stage 2	-	-	-	424	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1262	-	-	401	754
Stage 1	-	-	-	763	-
Stage 2	-	-	-	660	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1262	-	-	379	754
Mov Cap-2 Maneuver	-	-	-	379	-
Stage 1	-	-	-	721	-
Stage 2	-	-	-	660	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1262	-	-	-	552
HCM Lane V/C Ratio	0.045	-	-	-	0.185
HCM Control Delay (s)	8	0	-	-	13
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7

Robertson Street Assemblage TIA
17: Smithfield Rd & First Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	272	248	14	115	344	55	11	339	78	51	416	361
Future Volume (vph)	272	248	14	115	344	55	11	339	78	51	416	361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		2%			-2%			-2%			8%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996			0.986			0.975			0.941	
Flt Protected		0.975			0.989			0.999			0.997	
Satd. Flow (prot)	0	1791	0	0	1835	0	0	1833	0	0	1678	0
Flt Permitted		0.513			0.776			0.974			0.929	
Satd. Flow (perm)	0	942	0	0	1440	0	0	1787	0	0	1563	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1108			1409			1184			1107	
Travel Time (s)		30.2			38.4			23.1			21.6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	302	276	16	128	382	61	12	377	87	57	462	401
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	594	0	0	571	0	0	476	0	0	920	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	0.99	0.99	0.99	0.99	0.99	0.99	1.05	1.05	1.05
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	67.0	67.0		67.0	67.0		63.0	63.0		63.0	63.0	
Total Split (%)	51.5%	51.5%		51.5%	51.5%		48.5%	48.5%		48.5%	48.5%	

Robertson Street Assemblage TIA
17: Smithfield Rd & First Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Maximum Green (s)	62.5	62.5		62.2	62.2		57.8	57.8		57.9	57.9	
Yellow Time (s)	3.1	3.1		3.3	3.3		4.0	4.0		3.4	3.4	
All-Red Time (s)	1.4	1.4		1.5	1.5		1.2	1.2		1.7	1.7	
Lost Time Adjust (s)		0.5			0.2			-0.2			-0.1	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		62.0			62.0			58.0			58.0	
Actuated g/C Ratio		0.48			0.48			0.45			0.45	
v/c Ratio		1.32			0.83			0.60			1.32	
Control Delay		190.7			41.9			31.1			185.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		190.7			41.9			31.1			185.6	
LOS		F			D			C			F	
Approach Delay		190.7			41.9			31.1			185.6	
Approach LOS		F			D			C			F	
Queue Length 50th (ft)		~647			407			297			~1000	
Queue Length 95th (ft)		#876			#624			413			#1254	
Internal Link Dist (ft)		1028			1329			1104			1027	
Turn Bay Length (ft)												
Base Capacity (vph)		449			686			797			697	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		1.32			0.83			0.60			1.32	

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Natural Cycle:	130
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.32
Intersection Signal Delay:	126.0
Intersection LOS:	F
Intersection Capacity Utilization:	136.9%
ICU Level of Service:	H
Analysis Period (min):	15
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 17: Smithfield Rd & First Ave



MOVEMENT SUMMARY

Site: 2 [Knightdale Station Run / Carolinian Ave (Site Folder: Robertson St TIA)]

2028 Build AM Peak Hour
 Site Category: Proposed Design 1
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Carolinian Ave														
3	L2	70	2.0	78	2.0	0.295	7.8	LOS A	1.4	34.6	0.61	0.57	0.61	23.6
8	T1	125	2.0	139	2.0	0.295	7.8	LOS A	1.4	34.6	0.61	0.57	0.61	23.3
18	R2	21	2.0	23	2.0	0.295	7.8	LOS A	1.4	34.6	0.61	0.57	0.61	22.8
Approach		216	2.0	240	2.0	0.295	7.8	LOS A	1.4	34.6	0.61	0.57	0.61	23.3
East: Knightdale Station Run														
1	L2	10	2.0	11	2.0	0.386	7.5	LOS A	2.2	55.0	0.51	0.38	0.51	23.9
6	T1	117	2.0	130	2.0	0.386	7.5	LOS A	2.2	55.0	0.51	0.38	0.51	23.6
16	R2	238	2.0	264	2.0	0.386	7.5	LOS A	2.2	55.0	0.51	0.38	0.51	23.0
Approach		365	2.0	406	2.0	0.386	7.5	LOS A	2.2	55.0	0.51	0.38	0.51	23.2
North: Carolinian Ave														
7	L2	234	2.0	260	2.0	0.311	6.4	LOS A	1.6	41.6	0.45	0.32	0.45	23.4
4	T1	48	2.0	53	2.0	0.311	6.4	LOS A	1.6	41.6	0.45	0.32	0.45	23.1
14	R2	20	2.0	22	2.0	0.311	6.4	LOS A	1.6	41.6	0.45	0.32	0.45	22.6
Approach		302	2.0	336	2.0	0.311	6.4	LOS A	1.6	41.6	0.45	0.32	0.45	23.3
West: Knightdale Station Run														
5	L2	23	2.0	26	2.0	0.274	6.5	LOS A	1.3	33.7	0.51	0.42	0.51	24.2
2	T1	184	2.0	204	2.0	0.274	6.5	LOS A	1.3	33.7	0.51	0.42	0.51	23.8
12	R2	31	2.0	34	2.0	0.274	6.5	LOS A	1.3	33.7	0.51	0.42	0.51	23.3
Approach		238	2.0	264	2.0	0.274	6.5	LOS A	1.3	33.7	0.51	0.42	0.51	23.8
All Vehicles		1121	2.0	1246	2.0	0.386	7.0	LOS A	2.2	55.0	0.51	0.41	0.51	23.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 9 [Robertson St / Site Access 1 / Site Access 1A (Site Folder: Robertson St TIA)]

2028 Build AM Peak Hour
 Site Category: Proposed Design 1
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Site Access 1														
3	L2	50	2.0	56	2.0	0.072	3.9	LOS A	0.3	7.7	0.35	0.21	0.35	24.1
8	T1	4	2.0	4	2.0	0.072	3.9	LOS A	0.3	7.7	0.35	0.21	0.35	23.7
18	R2	16	2.0	18	2.0	0.072	3.9	LOS A	0.3	7.7	0.35	0.21	0.35	23.2
Approach		70	2.0	78	2.0	0.072	3.9	LOS A	0.3	7.7	0.35	0.21	0.35	23.9
East: Robertson Street														
1	L2	6	2.0	7	2.0	0.256	5.1	LOS A	1.4	34.7	0.23	0.10	0.23	24.7
6	T1	282	2.0	313	2.0	0.256	5.1	LOS A	1.4	34.7	0.23	0.10	0.23	24.3
16	R2	4	2.0	4	2.0	0.256	5.1	LOS A	1.4	34.7	0.23	0.10	0.23	23.8
Approach		292	2.0	324	2.0	0.256	5.1	LOS A	1.4	34.7	0.23	0.10	0.23	24.3
North: Site Access 1A														
7	L2	4	2.0	4	2.0	0.015	4.1	LOS A	0.1	1.4	0.45	0.29	0.45	24.5
4	T1	4	2.0	4	2.0	0.015	4.1	LOS A	0.1	1.4	0.45	0.29	0.45	24.1
14	R2	4	2.0	4	2.0	0.015	4.1	LOS A	0.1	1.4	0.45	0.29	0.45	23.6
Approach		12	2.0	13	2.0	0.015	4.1	LOS A	0.1	1.4	0.45	0.29	0.45	24.1
West: Robertson Street														
5	L2	4	2.0	4	2.0	0.173	4.1	LOS A	0.9	21.6	0.09	0.02	0.09	25.0
2	T1	181	2.0	201	2.0	0.173	4.1	LOS A	0.9	21.6	0.09	0.02	0.09	24.6
12	R2	22	2.0	24	2.0	0.173	4.1	LOS A	0.9	21.6	0.09	0.02	0.09	24.0
Approach		207	2.0	230	2.0	0.173	4.1	LOS A	0.9	21.6	0.09	0.02	0.09	24.5
All Vehicles		581	2.0	646	2.0	0.256	4.6	LOS A	1.4	34.7	0.20	0.09	0.20	24.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Knightdale Station Run / Carolinian Ave (Site Folder: Robertson St TIA)]

2028 Build PM Peak Hour
 Site Category: Proposed Design 1
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Carolinian Ave														
3	L2	58	2.0	64	2.0	0.128	4.0	LOS A	0.6	14.9	0.23	0.10	0.23	24.5
8	T1	81	2.0	90	2.0	0.128	4.0	LOS A	0.6	14.9	0.23	0.10	0.23	24.1
18	R2	4	2.0	4	2.0	0.128	4.0	LOS A	0.6	14.9	0.23	0.10	0.23	23.6
Approach		143	2.0	159	2.0	0.128	4.0	LOS A	0.6	14.9	0.23	0.10	0.23	24.3
East: Knightdale Station Run														
1	L2	4	2.0	4	2.0	0.078	3.9	LOS A	0.3	8.5	0.32	0.19	0.32	24.9
6	T1	33	2.0	37	2.0	0.078	3.9	LOS A	0.3	8.5	0.32	0.19	0.32	24.5
16	R2	42	2.0	47	2.0	0.078	3.9	LOS A	0.3	8.5	0.32	0.19	0.32	23.9
Approach		79	2.0	88	2.0	0.078	3.9	LOS A	0.3	8.5	0.32	0.19	0.32	24.2
North: Carolinian Ave														
7	L2	35	2.0	39	2.0	0.173	4.5	LOS A	0.8	21.0	0.27	0.14	0.27	24.6
4	T1	118	2.0	131	2.0	0.173	4.5	LOS A	0.8	21.0	0.27	0.14	0.27	24.2
14	R2	36	2.0	40	2.0	0.173	4.5	LOS A	0.8	21.0	0.27	0.14	0.27	23.7
Approach		189	2.0	210	2.0	0.173	4.5	LOS A	0.8	21.0	0.27	0.14	0.27	24.2
West: Knightdale Station Run														
5	L2	19	2.0	21	2.0	0.133	4.3	LOS A	0.6	15.2	0.34	0.20	0.34	24.6
2	T1	21	2.0	23	2.0	0.133	4.3	LOS A	0.6	15.2	0.34	0.20	0.34	24.2
12	R2	95	2.0	106	2.0	0.133	4.3	LOS A	0.6	15.2	0.34	0.20	0.34	23.7
Approach		135	2.0	150	2.0	0.133	4.3	LOS A	0.6	15.2	0.34	0.20	0.34	23.9
All Vehicles		546	2.0	607	2.0	0.173	4.2	LOS A	0.8	21.0	0.28	0.15	0.28	24.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 9 [Robertson St / Site Access 1 / Site Access 1A (Site Folder: Robertson St TIA)]

2028 Build PM Peak Hour
 Site Category: Proposed Design 1
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist ft]				
South: Site Access 1														
3	L2	32	2.0	36	2.0	0.055	4.4	LOS A	0.2	5.6	0.45	0.33	0.45	24.0
8	T1	4	2.0	4	2.0	0.055	4.4	LOS A	0.2	5.6	0.45	0.33	0.45	23.6
18	R2	10	2.0	11	2.0	0.055	4.4	LOS A	0.2	5.6	0.45	0.33	0.45	23.1
Approach		46	2.0	51	2.0	0.055	4.4	LOS A	0.2	5.6	0.45	0.33	0.45	23.8
East: Robertson Street														
1	L2	19	2.0	21	2.0	0.274	5.2	LOS A	1.5	38.3	0.19	0.07	0.19	24.6
6	T1	296	2.0	329	2.0	0.274	5.2	LOS A	1.5	38.3	0.19	0.07	0.19	24.3
16	R2	4	2.0	4	2.0	0.274	5.2	LOS A	1.5	38.3	0.19	0.07	0.19	23.7
Approach		319	2.0	354	2.0	0.274	5.2	LOS A	1.5	38.3	0.19	0.07	0.19	24.3
North: Site Access 1A														
7	L2	4	2.0	4	2.0	0.015	4.1	LOS A	0.1	1.5	0.45	0.29	0.45	24.5
4	T1	4	2.0	4	2.0	0.015	4.1	LOS A	0.1	1.5	0.45	0.29	0.45	24.1
14	R2	4	2.0	4	2.0	0.015	4.1	LOS A	0.1	1.5	0.45	0.29	0.45	23.6
Approach		12	2.0	13	2.0	0.015	4.1	LOS A	0.1	1.5	0.45	0.29	0.45	24.1
West: Robertson Street														
5	L2	4	2.0	4	2.0	0.334	5.8	LOS A	2.0	50.9	0.16	0.05	0.16	24.5
2	T1	317	2.0	352	2.0	0.334	5.8	LOS A	2.0	50.9	0.16	0.05	0.16	24.1
12	R2	73	2.0	81	2.0	0.334	5.8	LOS A	2.0	50.9	0.16	0.05	0.16	23.6
Approach		394	2.0	438	2.0	0.334	5.8	LOS A	2.0	50.9	0.16	0.05	0.16	24.0
All Vehicles		771	2.0	857	2.0	0.334	5.4	LOS A	2.0	50.9	0.19	0.08	0.19	24.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

2028 Build + Improvements Traffic Volumes

Robertson Street Assemblage TIA
 11: Site Access 3 & Robertson St

10/06/2022

Intersection						
Int Delay, s/veh	1.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	204	7	11	242	43	34
Future Vol, veh/h	204	7	11	242	43	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	227	8	12	269	48	38

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	235	0	524 231
Stage 1	-	-	-	-	231 -
Stage 2	-	-	-	-	293 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1332	-	514 808
Stage 1	-	-	-	-	807 -
Stage 2	-	-	-	-	757 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1332	-	509 808
Mov Cap-2 Maneuver	-	-	-	-	509 -
Stage 1	-	-	-	-	807 -
Stage 2	-	-	-	-	750 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	608	-	-	1332	-
HCM Lane V/C Ratio	0.141	-	-	0.009	-
HCM Control Delay (s)	11.9	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Robertson Street Assemblage TIA
 11: Site Access 3 & Robertson St

10/06/2022

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	302	27	36	301	27	21
Future Vol, veh/h	302	27	36	301	27	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	336	30	40	334	30	23

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	366	0	765 351
Stage 1	-	-	-	-	351 -
Stage 2	-	-	-	-	414 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1193	-	371 692
Stage 1	-	-	-	-	713 -
Stage 2	-	-	-	-	667 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1193	-	358 692
Mov Cap-2 Maneuver	-	-	-	-	358 -
Stage 1	-	-	-	-	713 -
Stage 2	-	-	-	-	644 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	14
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	454	-	-	1193	-
HCM Lane V/C Ratio	0.117	-	-	0.034	-
HCM Control Delay (s)	14	-	-	8.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

2038 Build Traffic Volumes

Robertson Street Assemblage TIA
1: Carolinian Ave & Knightdale Blvd

10/06/2022



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	14	777	181	146	1364	350	160
Future Volume (vph)	14	777	181	146	1364	350	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			3%	-1%	
Storage Length (ft)	250		225	275		275	275
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Frt			0.850				0.850
Flt Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1787	3575	1599	1743	3486	3450	1591
Flt Permitted	0.112			0.231		0.950	
Satd. Flow (perm)	211	3575	1599	424	3486	3450	1591
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	25	
Link Distance (ft)		948			1123	1095	
Travel Time (s)		14.4			17.0	29.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	16	863	201	162	1516	389	178
Shared Lane Traffic (%)							
Lane Group Flow (vph)	16	863	201	162	1516	389	178
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		12			12	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	0.99	1.02	1.02	0.99	0.99
Turning Speed (mph)	9		9	15		15	9
Turn Type	D.Pm	NA	pm+ov	D,P+P	NA	Prot	pm+ov
Protected Phases		2	8	1	6	8	1
Permitted Phases	6		2	2			8
Detector Phase	6	2	8	1	6	8	1
Switch Phase							
Minimum Initial (s)	12.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	25.0	32.1	25.0	14.0	25.0	25.0	14.0
Total Split (s)	63.0	49.0	27.0	14.0	63.0	27.0	14.0
Total Split (%)	70.0%	54.4%	30.0%	15.6%	70.0%	30.0%	15.6%
Maximum Green (s)	55.9	41.9	20.1	7.3	55.9	20.1	7.3
Yellow Time (s)	4.7	4.7	3.0	3.0	4.7	3.0	3.0
All-Red Time (s)	2.4	2.4	3.9	3.7	2.4	3.9	3.7
Lost Time Adjust (s)	-2.1	-2.1	-1.9	-1.7	-2.1	-1.9	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lag		Lead			Lead
Lead-Lag Optimize?		Yes		Yes			Yes
Vehicle Extension (s)	6.0	6.0	2.0	2.0	6.0	2.0	2.0
Minimum Gap (s)	3.0	3.0	2.0	2.0	3.0	2.0	2.0

Robertson Street Assemblage TIA
1: Carolinian Ave & Knightdale Blvd

10/06/2022

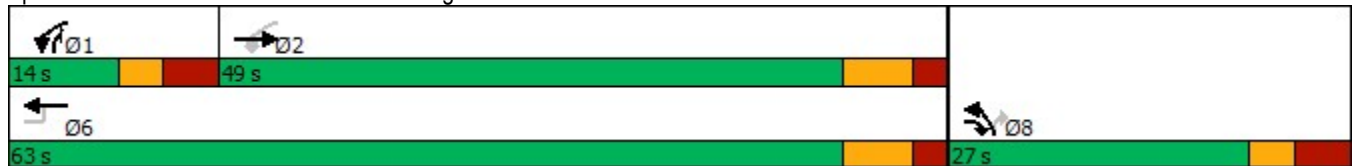


Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Time Before Reduce (s)	20.0	20.0	0.0	0.0	20.0	0.0	0.0
Time To Reduce (s)	45.0	45.0	0.0	0.0	45.0	0.0	0.0
Recall Mode	Min	Min	None	None	Min	None	None
Walk Time (s)		7.0					
Flash Dont Walk (s)		18.0					
Pedestrian Calls (#/hr)		0					
Act Effct Green (s)	40.5	26.4	45.3	35.4	40.5	13.8	28.0
Actuated g/C Ratio	0.63	0.41	0.70	0.55	0.63	0.21	0.43
v/c Ratio	0.12	0.59	0.18	0.39	0.69	0.53	0.26
Control Delay	8.1	16.8	3.4	8.5	10.3	26.2	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.1	16.8	3.4	8.5	10.3	26.2	14.4
LOS	A	B	A	A	B	C	B
Approach Delay		14.2			10.1	22.5	
Approach LOS		B			B	C	
Queue Length 50th (ft)	2	130	21	22	171	71	44
Queue Length 95th (ft)	12	210	36	53	306	126	101
Internal Link Dist (ft)		868			1043	1015	
Turn Bay Length (ft)	250		225	275		275	275
Base Capacity (vph)	187	2495	1337	421	3096	1204	693
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.35	0.15	0.38	0.49	0.32	0.26

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	64.6
Natural Cycle:	75
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	13.5
Intersection LOS:	B
Intersection Capacity Utilization:	70.2%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 1: Carolinian Ave & Knightdale Blvd



Robertson Street Assemblage TIA
 2: Carolinian Ave & Knightdale Station Run

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	25	203	32	11	129	263	71	132	23	258	51	22
Future Volume (vph)	25	203	32	11	129	263	71	132	23	258	51	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.983			0.912			0.986			0.991	
Fl _t Protected		0.995			0.999			0.985			0.962	
Satd. Flow (prot)	0	1822	0	0	1697	0	0	1809	0	0	1776	0
Fl _t Permitted		0.995			0.999			0.985			0.962	
Satd. Flow (perm)	0	1822	0	0	1697	0	0	1809	0	0	1776	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		910			556			1007			1095	
Travel Time (s)		24.8			15.2			27.5			29.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	226	36	12	143	292	79	147	26	287	57	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	290	0	0	447	0	0	252	0	0	368	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	66.1%
ICU Level of Service	C
Analysis Period (min)	15

Robertson Street Assemblage TIA
 3: First Ave & Knightdale Station Run

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	168	50	463	191	39	304
Future Volume (vph)	168	50	463	191	39	304
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.961			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1790	0	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1790	0	1770	1863
Link Speed (mph)	25		35			35
Link Distance (ft)	1463		1498			771
Travel Time (s)	39.9		29.2			15.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	187	56	514	212	43	338
Shared Lane Traffic (%)						
Lane Group Flow (vph)	187	56	726	0	43	338
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.0%
	ICU Level of Service A
Analysis Period (min)	15

Robertson Street Assemblage TIA
3: First Ave & Knightdale Station Run

10/06/2022

Intersection						
Int Delay, s/veh	8.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	168	50	463	191	39	304
Future Vol, veh/h	168	50	463	191	39	304
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	187	56	514	212	43	338

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1044	620	0	0	726	0
Stage 1	620	-	-	-	-	-
Stage 2	424	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	254	488	-	-	877	-
Stage 1	536	-	-	-	-	-
Stage 2	660	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	242	488	-	-	877	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	536	-	-	-	-	-
Stage 2	628	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	46.8	0	1.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	242	488	877
HCM Lane V/C Ratio	-	-	0.771	0.114	0.049
HCM Control Delay (s)	-	-	56.8	13.3	9.3
HCM Lane LOS	-	-	F	B	A
HCM 95th %tile Q(veh)	-	-	5.6	0.4	0.2

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	7	30	41	7	35	4	133	9	10	4	5	19
Future Volume (vph)	7	30	41	7	35	4	133	9	10	4	5	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.929			0.989			0.991			0.909	
Fl _t Protected		0.995			0.992			0.958			0.994	
Satd. Flow (prot)	0	1722	0	0	1828	0	0	1768	0	0	1683	0
Fl _t Permitted		0.995			0.992			0.958			0.994	
Satd. Flow (perm)	0	1722	0	0	1828	0	0	1768	0	0	1683	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1007			1193			1169			1254	
Travel Time (s)		27.5			32.5			31.9			34.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	33	46	8	39	4	148	10	11	4	6	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	87	0	0	51	0	0	169	0	0	31	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	27.1%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	30	41	7	35	4	133	9	10	4	5	19
Future Vol, veh/h	7	30	41	7	35	4	133	9	10	4	5	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	33	46	8	39	4	148	10	11	4	6	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	43	0	0	79	0	0	143	131	56	140	152	41
Stage 1	-	-	-	-	-	-	72	72	-	57	57	-
Stage 2	-	-	-	-	-	-	71	59	-	83	95	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1566	-	-	1519	-	-	826	760	1011	830	740	1030
Stage 1	-	-	-	-	-	-	938	835	-	955	847	-
Stage 2	-	-	-	-	-	-	939	846	-	925	816	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1566	-	-	1519	-	-	798	752	1011	807	733	1030
Mov Cap-2 Maneuver	-	-	-	-	-	-	798	752	-	807	733	-
Stage 1	-	-	-	-	-	-	933	831	-	950	843	-
Stage 2	-	-	-	-	-	-	909	842	-	899	812	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			1.1			10.6			9		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	806	1566	-	-	1519	-	-	926
HCM Lane V/C Ratio	0.21	0.005	-	-	0.005	-	-	0.034
HCM Control Delay (s)	10.6	7.3	0	-	7.4	0	-	9
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.8	0	-	-	0	-	-	0.1

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	8	32	11	54	56	4
Future Volume (vph)	8	32	11	54	56	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.892				0.992	
Flt Protected	0.990			0.992		
Satd. Flow (prot)	1645	0	0	1848	1848	0
Flt Permitted	0.990			0.992		
Satd. Flow (perm)	1645	0	0	1848	1848	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	997			2466	1085	
Travel Time (s)	27.2			37.4	16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	36	12	60	62	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	45	0	0	72	66	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.1%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	8	32	11	54	56	4
Future Vol, veh/h	8	32	11	54	56	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	36	12	60	62	4

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	148	64	66	0	0
Stage 1	64	-	-	-	-
Stage 2	84	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	844	1000	1536	-	-
Stage 1	959	-	-	-	-
Stage 2	939	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	837	1000	1536	-	-
Mov Cap-2 Maneuver	837	-	-	-	-
Stage 1	951	-	-	-	-
Stage 2	939	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1536	-	963	-	-
HCM Lane V/C Ratio	0.008	-	0.046	-	-
HCM Control Delay (s)	7.4	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	77	484	4	19	429
Future Volume (vph)	5	77	484	4	19	429
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.874		0.999			
Flt Protected	0.997					0.998
Satd. Flow (prot)	1623	0	1861	0	0	1859
Flt Permitted	0.997					0.998
Satd. Flow (perm)	1623	0	1861	0	0	1859
Link Speed (mph)	15		35			35
Link Distance (ft)	1616		1292			1498
Travel Time (s)	73.5		25.2			29.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	86	538	4	21	477
Shared Lane Traffic (%)						
Lane Group Flow (vph)	92	0	542	0	0	498
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.7%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
6: First Ave & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	77	484	4	19	429
Future Vol, veh/h	5	77	484	4	19	429
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	86	538	4	21	477

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1059	540	0	0	542	0
Stage 1	540	-	-	-	-	-
Stage 2	519	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	249	542	-	-	1027	-
Stage 1	584	-	-	-	-	-
Stage 2	597	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	242	542	-	-	1027	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	584	-	-	-	-	-
Stage 2	580	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.7	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	504	1027
HCM Lane V/C Ratio	-	-	0.181	0.021
HCM Control Delay (s)	-	-	13.7	8.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1

Robertson Street Assemblage TIA
7: First Ave & Robertson St

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	220	141	310	107	95	302
Future Volume (vph)	220	141	310	107	95	302
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.947		0.965			
Flt Protected	0.970					0.988
Satd. Flow (prot)	1711	0	1798	0	0	1840
Flt Permitted	0.970					0.988
Satd. Flow (perm)	1711	0	1798	0	0	1840
Link Speed (mph)	25		35			35
Link Distance (ft)	1195		1409			1292
Travel Time (s)	32.6		27.4			25.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	244	157	344	119	106	336
Shared Lane Traffic (%)						
Lane Group Flow (vph)	401	0	463	0	0	442
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	74.8%
Analysis Period (min)	15
	ICU Level of Service D

Robertson Street Assemblage TIA
7: First Ave & Robertson St

10/06/2022

Intersection						
Int Delay, s/veh	47.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	220	141	310	107	95	302
Future Vol, veh/h	220	141	310	107	95	302
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	244	157	344	119	106	336

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	952	404	0	0	463	0
Stage 1	404	-	-	-	-	-
Stage 2	548	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	288	647	-	-	1098	-
Stage 1	674	-	-	-	-	-
Stage 2	579	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	254	647	-	-	1098	-
Mov Cap-2 Maneuver	254	-	-	-	-	-
Stage 1	674	-	-	-	-	-
Stage 2	510	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	151.2	0	2.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	333	1098
HCM Lane V/C Ratio	-	-	1.205	0.096
HCM Control Delay (s)	-	-	151.2	8.6
HCM Lane LOS	-	-	F	A
HCM 95th %tile Q(veh)	-	-	17.2	0.3



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	181	292	58	32	10
Future Volume (vph)	5	181	292	58	32	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.978		0.968	
Flt Protected		0.999			0.963	
Satd. Flow (prot)	0	1861	1822	0	1736	0
Flt Permitted		0.999			0.963	
Satd. Flow (perm)	0	1861	1822	0	1736	0
Link Speed (mph)		25	25		25	
Link Distance (ft)		1195	2012		1616	
Travel Time (s)		32.6	54.9		44.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	201	324	64	36	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	207	388	0	47	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.9%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 8: Robertson St & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	5	181	292	58	32	10
Future Vol, veh/h	5	181	292	58	32	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	201	324	64	36	11

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	388	0	-	0	569 356
Stage 1	-	-	-	-	356 -
Stage 2	-	-	-	-	213 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1170	-	-	-	484 688
Stage 1	-	-	-	-	709 -
Stage 2	-	-	-	-	823 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1170	-	-	-	481 688
Mov Cap-2 Maneuver	-	-	-	-	481 -
Stage 1	-	-	-	-	705 -
Stage 2	-	-	-	-	823 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1170	-	-	-	518
HCM Lane V/C Ratio	0.005	-	-	-	0.09
HCM Control Delay (s)	8.1	0	-	-	12.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Robertson Street Assemblage TIA
 9: Site Access 1/Site Access 1A & Robertson St

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	4	191	22	6	300	4	50	4	16	4	4	4
Future Volume (vph)	4	191	22	6	300	4	50	4	16	4	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.986			0.998			0.969			0.955	
Fl _t Protected		0.999			0.999			0.965			0.984	
Satd. Flow (prot)	0	1835	0	0	1857	0	0	1742	0	0	1750	0
Fl _t Permitted		0.999			0.999			0.965			0.984	
Satd. Flow (perm)	0	1835	0	0	1857	0	0	1742	0	0	1750	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2012			431			1157			209	
Travel Time (s)		39.2			8.4			31.6			5.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	212	24	7	333	4	56	4	18	4	4	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	240	0	0	344	0	0	78	0	0	12	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.6%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 9: Site Access 1/Site Access 1A & Robertson St

10/06/2022

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	191	22	6	300	4	50	4	16	4	4	4
Future Vol, veh/h	4	191	22	6	300	4	50	4	16	4	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	212	24	7	333	4	56	4	18	4	4	4

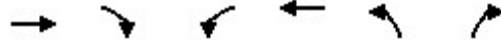
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	337	0	0	236	0	0	585	583	224	592	593	335
Stage 1	-	-	-	-	-	-	232	232	-	349	349	-
Stage 2	-	-	-	-	-	-	353	351	-	243	244	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1222	-	-	1331	-	-	422	424	815	418	418	707
Stage 1	-	-	-	-	-	-	771	713	-	667	633	-
Stage 2	-	-	-	-	-	-	664	632	-	761	704	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1222	-	-	1331	-	-	413	420	815	403	414	707
Mov Cap-2 Maneuver	-	-	-	-	-	-	413	420	-	403	414	-
Stage 1	-	-	-	-	-	-	768	710	-	664	629	-
Stage 2	-	-	-	-	-	-	651	628	-	737	701	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.1			14.3			12.8		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	466	1222	-	-	1331	-	-	475
HCM Lane V/C Ratio	0.167	0.004	-	-	0.005	-	-	0.028
HCM Control Delay (s)	14.3	8	0	-	7.7	0	-	12.8
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.1

Robertson Street Assemblage TIA
 10: Site Access 2 & Robertson St

10/06/2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	204	4	5	298	8	17
Future Volume (vph)	204	4	5	298	8	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.998			0.908		
Fl _t Protected				0.999	0.984	
Satd. Flow (prot)	1859	0	0	1861	1664	0
Fl _t Permitted				0.999	0.984	
Satd. Flow (perm)	1859	0	0	1861	1664	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	431			605	752	
Travel Time (s)	8.4			11.8	20.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	227	4	6	331	9	19
Shared Lane Traffic (%)						
Lane Group Flow (vph)	231	0	0	337	28	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.7%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
10: Site Access 2 & Robertson St

10/06/2022

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	204	4	5	298	8	17
Future Vol, veh/h	204	4	5	298	8	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	227	4	6	331	9	19

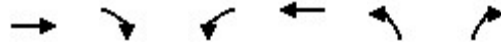
Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	231	0	572
Stage 1	-	-	-	-	229
Stage 2	-	-	-	-	343
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1337	-	482
Stage 1	-	-	-	-	809
Stage 2	-	-	-	-	719
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1337	-	480
Mov Cap-2 Maneuver	-	-	-	-	480
Stage 1	-	-	-	-	809
Stage 2	-	-	-	-	715

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	664	-	-	1337	-
HCM Lane V/C Ratio	0.042	-	-	0.004	-
HCM Control Delay (s)	10.7	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Robertson Street Assemblage TIA
 11: Site Access 3 & Robertson St

10/06/2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	214	7	11	260	43	34
Future Volume (vph)	214	7	11	260	43	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	50		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			100		100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.996				0.940	
Flt Protected			0.950		0.973	
Satd. Flow (prot)	1855	0	1770	1863	1704	0
Flt Permitted			0.950		0.973	
Satd. Flow (perm)	1855	0	1770	1863	1704	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	605			535	566	
Travel Time (s)	11.8			10.4	15.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	238	8	12	289	48	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	246	0	12	289	86	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	24.8%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 11: Site Access 3 & Robertson St

10/06/2022

Intersection						
Int Delay, s/veh	1.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	214	7	11	260	43	34
Future Vol, veh/h	214	7	11	260	43	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	238	8	12	289	48	38

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	246	0	555 242
Stage 1	-	-	-	-	242 -
Stage 2	-	-	-	-	313 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1320	-	493 797
Stage 1	-	-	-	-	798 -
Stage 2	-	-	-	-	741 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1320	-	489 797
Mov Cap-2 Maneuver	-	-	-	-	489 -
Stage 1	-	-	-	-	798 -
Stage 2	-	-	-	-	734 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	12.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	590	-	-	1320	-
HCM Lane V/C Ratio	0.145	-	-	0.009	-
HCM Control Delay (s)	12.1	-	-	7.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Robertson Street Assemblage TIA
 12: Robertson St & Site Access 4

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	12	236	263	5	4	8
Future Volume (vph)	12	236	263	5	4	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.997		0.907	
Flt Protected		0.998			0.985	
Satd. Flow (prot)	0	1859	1857	0	1664	0
Flt Permitted		0.998			0.985	
Satd. Flow (perm)	0	1859	1857	0	1664	0
Link Speed (mph)		35	35		10	
Link Distance (ft)		535	213		253	
Travel Time (s)		10.4	4.1		17.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	262	292	6	4	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	275	298	0	13	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.2%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 12: Robertson St & Site Access 4

10/06/2022

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	12	236	263	5	4	8
Future Vol, veh/h	12	236	263	5	4	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	262	292	6	4	9

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	298	0	0	583	295
Stage 1	-	-	-	295	-
Stage 2	-	-	-	288	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1263	-	-	475	744
Stage 1	-	-	-	755	-
Stage 2	-	-	-	761	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1263	-	-	469	744
Mov Cap-2 Maneuver	-	-	-	469	-
Stage 1	-	-	-	746	-
Stage 2	-	-	-	761	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1263	-	-	-	622
HCM Lane V/C Ratio	0.011	-	-	-	0.021
HCM Control Delay (s)	7.9	0	-	-	10.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Robertson Street Assemblage TIA
 13: Robertson St & Site Access 5

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	12	227	260	8	5	8
Future Volume (vph)	12	227	260	8	5	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.996		0.919	
Flt Protected		0.998			0.980	
Satd. Flow (prot)	0	1859	1855	0	1678	0
Flt Permitted		0.998			0.980	
Satd. Flow (perm)	0	1859	1855	0	1678	0
Link Speed (mph)		35	35		10	
Link Distance (ft)		213	852		269	
Travel Time (s)		4.1	16.6		18.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	252	289	9	6	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	265	298	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	31.7%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 13: Robertson St & Site Access 5

10/06/2022

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	12	227	260	8	5	8
Future Vol, veh/h	12	227	260	8	5	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	252	289	9	6	9

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	298	0	-	0	572 294
Stage 1	-	-	-	-	294 -
Stage 2	-	-	-	-	278 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1263	-	-	-	482 745
Stage 1	-	-	-	-	756 -
Stage 2	-	-	-	-	769 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1263	-	-	-	476 745
Mov Cap-2 Maneuver	-	-	-	-	476 -
Stage 1	-	-	-	-	747 -
Stage 2	-	-	-	-	769 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1263	-	-	-	612
HCM Lane V/C Ratio	0.011	-	-	-	0.024
HCM Control Delay (s)	7.9	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Robertson Street Assemblage TIA

14: Mailman Rd/Site Access 6 & Robertson St/Knightdale Eagle Rock Rd

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	12	201	24	33	222	8	26	4	28	5	4	8
Future Volume (vph)	12	201	24	33	222	8	26	4	28	5	4	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.986			0.996			0.935			0.936	
Fl _t Protected		0.998			0.994			0.978			0.984	
Satd. Flow (prot)	0	1833	0	0	1844	0	0	1703	0	0	1716	0
Fl _t Permitted		0.998			0.994			0.978			0.984	
Satd. Flow (perm)	0	1833	0	0	1844	0	0	1703	0	0	1716	0
Link Speed (mph)		35			45			55			10	
Link Distance (ft)		852			285			807			349	
Travel Time (s)		16.6			4.3			10.0			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	223	27	37	247	9	29	4	31	6	4	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	263	0	0	293	0	0	64	0	0	19	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	201	24	33	222	8	26	4	28	5	4	8
Future Vol, veh/h	12	201	24	33	222	8	26	4	28	5	4	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	223	27	37	247	9	29	4	31	6	4	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	256	0	0	250	0	0	595	593	237	606	602	252
Stage 1	-	-	-	-	-	-	263	263	-	326	326	-
Stage 2	-	-	-	-	-	-	332	330	-	280	276	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1309	-	-	1316	-	-	416	418	802	409	414	787
Stage 1	-	-	-	-	-	-	742	691	-	687	648	-
Stage 2	-	-	-	-	-	-	681	646	-	727	682	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1309	-	-	1316	-	-	394	399	802	377	395	787
Mov Cap-2 Maneuver	-	-	-	-	-	-	394	399	-	377	395	-
Stage 1	-	-	-	-	-	-	733	683	-	679	627	-
Stage 2	-	-	-	-	-	-	646	625	-	686	674	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	1	12.8	12.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	523	1309	-	-	1316	-	-	507
HCM Lane V/C Ratio	0.123	0.01	-	-	0.028	-	-	0.037
HCM Control Delay (s)	12.8	7.8	0	-	7.8	0	-	12.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0.1	-	-	0.1

Robertson Street Assemblage TIA
 15: Knightdale Eagle Rock Rd & Site Access 7

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	217	268	8	5	6
Future Volume (vph)	13	217	268	8	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.996		0.927	
Flt Protected		0.997			0.977	
Satd. Flow (prot)	0	1857	1855	0	1687	0
Flt Permitted		0.997			0.977	
Satd. Flow (perm)	0	1857	1855	0	1687	0
Link Speed (mph)		45	45		10	
Link Distance (ft)		285	1096		338	
Travel Time (s)		4.3	16.6		23.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	14	241	298	9	6	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	255	307	0	13	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Stop	Stop		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.1%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	40	182	232	17	38	44
Future Volume (vph)	40	182	232	17	38	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.991		0.927	
Flt Protected		0.991			0.977	
Satd. Flow (prot)	0	1846	1846	0	1687	0
Flt Permitted		0.991			0.977	
Satd. Flow (perm)	0	1846	1846	0	1687	0
Link Speed (mph)		45	45		45	
Link Distance (ft)		1096	1080		2466	
Travel Time (s)		16.6	16.4		37.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	44	202	258	19	42	49
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	246	277	0	91	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.8%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	40	182	232	17	38	44
Future Vol, veh/h	40	182	232	17	38	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	202	258	19	42	49

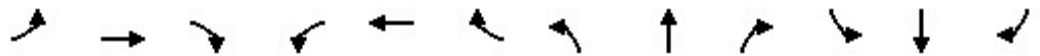
Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	277	0	-	0	558 268
Stage 1	-	-	-	-	268 -
Stage 2	-	-	-	-	290 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1286	-	-	-	491 771
Stage 1	-	-	-	-	777 -
Stage 2	-	-	-	-	759 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1286	-	-	-	472 771
Mov Cap-2 Maneuver	-	-	-	-	472 -
Stage 1	-	-	-	-	747 -
Stage 2	-	-	-	-	759 -

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1286	-	-	-	596
HCM Lane V/C Ratio	0.035	-	-	-	0.153
HCM Control Delay (s)	7.9	0	-	-	12.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Robertson Street Assemblage TIA
17: Smithfield Rd & First Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	293	225	4	86	254	78	11	357	81	31	213	171
Future Volume (vph)	293	225	4	86	254	78	11	357	81	31	213	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			-2%			8%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.975			0.976			0.944	
Flt Protected		0.973			0.990			0.999			0.996	
Satd. Flow (prot)	0	1793	0	0	1816	0	0	1834	0	0	1681	0
Flt Permitted		0.583			0.815			0.988			0.911	
Satd. Flow (perm)	0	1074	0	0	1495	0	0	1814	0	0	1538	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1108			1409			1184			1107	
Travel Time (s)		30.2			38.4			23.1			21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	326	250	4	96	282	87	12	397	90	34	237	190
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	580	0	0	465	0	0	499	0	0	461	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	0.99	0.99	0.99	0.99	0.99	0.99	1.05	1.05	1.05
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	43.0	43.0		43.0	43.0		27.0	27.0		27.0	27.0	
Total Split (%)	61.4%	61.4%		61.4%	61.4%		38.6%	38.6%		38.6%	38.6%	
Maximum Green (s)	38.5	38.5		38.2	38.2		21.8	21.8		21.9	21.9	
Yellow Time (s)	3.1	3.1		3.3	3.3		4.0	4.0		3.4	3.4	
All-Red Time (s)	1.4	1.4		1.5	1.5		1.2	1.2		1.7	1.7	
Lost Time Adjust (s)		0.5			0.2			-0.2			-0.1	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		38.0			38.0			21.8			21.8	
Actuated g/C Ratio		0.54			0.54			0.31			0.31	
v/c Ratio		0.99			0.57			0.88			0.96	

Robertson Street Assemblage TIA
 17: Smithfield Rd & First Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		54.7			14.1			42.8			59.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		54.7			14.1			42.8			59.4	
LOS		D			B			D			E	
Approach Delay		54.7			14.1			42.8			59.4	
Approach LOS		D			B			D			E	
Queue Length 50th (ft)		228			122			201			192	
Queue Length 95th (ft)		#446			206			#369			#368	
Internal Link Dist (ft)		1028			1329			1104			1027	
Turn Bay Length (ft)												
Base Capacity (vph)		585			814			572			485	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.99			0.57			0.87			0.95	

Intersection Summary

Area Type:	Other
Cycle Length:	70
Actuated Cycle Length:	69.8
Natural Cycle:	70
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.99
Intersection Signal Delay:	43.4
Intersection LOS:	D
Intersection Capacity Utilization:	101.4%
ICU Level of Service:	G
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 17: Smithfield Rd & First Ave



Robertson Street Assemblage TIA
1: Carolinian Ave & Knightdale Blvd

10/06/2022



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	29	1853	172	66	1097	144	61
Future Volume (vph)	29	1853	172	66	1097	144	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			3%	-1%	
Storage Length (ft)	250		225	275		275	275
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Frt			0.850				0.850
Flt Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1787	3575	1599	1743	3486	3450	1591
Flt Permitted	0.209			0.072		0.950	
Satd. Flow (perm)	393	3575	1599	132	3486	3450	1591
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	25	
Link Distance (ft)		948			1123	1095	
Travel Time (s)		14.4			17.0	29.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	32	2059	191	73	1219	160	68
Shared Lane Traffic (%)							
Lane Group Flow (vph)	32	2059	191	73	1219	160	68
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		12			12	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	0.99	1.02	1.02	0.99	0.99
Turning Speed (mph)	9		9	15		15	9
Turn Type	D.Pm	NA	pm+ov	D,P+P	NA	Prot	pm+ov
Protected Phases		2	8	1	6	8	1
Permitted Phases	6		2	2			8
Detector Phase	6	2	8	1	6	8	1
Switch Phase							
Minimum Initial (s)	12.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	25.0	32.1	25.0	14.0	25.0	25.0	14.0
Total Split (s)	75.0	61.0	25.0	14.0	75.0	25.0	14.0
Total Split (%)	75.0%	61.0%	25.0%	14.0%	75.0%	25.0%	14.0%
Maximum Green (s)	67.9	53.9	18.1	7.3	67.9	18.1	7.3
Yellow Time (s)	4.7	4.7	3.0	3.0	4.7	3.0	3.0
All-Red Time (s)	2.4	2.4	3.9	3.7	2.4	3.9	3.7
Lost Time Adjust (s)	-2.1	-2.1	-1.9	-1.7	-2.1	-1.9	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lag		Lead			Lead
Lead-Lag Optimize?		Yes		Yes			Yes
Vehicle Extension (s)	6.0	6.0	2.0	2.0	6.0	2.0	2.0
Minimum Gap (s)	3.0	3.0	2.0	2.0	3.0	2.0	2.0

Robertson Street Assemblage TIA
 1: Carolinian Ave & Knightdale Blvd

10/06/2022



Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Time Before Reduce (s)	20.0	20.0	0.0	0.0	20.0	0.0	0.0
Time To Reduce (s)	45.0	45.0	0.0	0.0	45.0	0.0	0.0
Recall Mode	Min	Min	None	None	Min	None	None
Walk Time (s)		7.0					
Flash Dont Walk (s)		18.0					
Pedestrian Calls (#/hr)		0					
Act Effct Green (s)	67.0	56.4	73.2	63.1	67.0	10.6	24.5
Actuated g/C Ratio	0.76	0.64	0.83	0.72	0.76	0.12	0.28
v/c Ratio	0.11	0.90	0.14	0.29	0.46	0.38	0.15
Control Delay	3.8	21.6	2.3	8.3	4.5	39.2	26.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.8	21.6	2.3	8.3	4.5	39.2	26.1
LOS	A	C	A	A	A	D	C
Approach Delay		19.7			4.7	35.3	
Approach LOS		B			A	D	
Queue Length 50th (ft)	4	499	19	8	98	44	30
Queue Length 95th (ft)	12	#779	33	29	149	74	63
Internal Link Dist (ft)		868			1043	1015	
Turn Bay Length (ft)	250		225	275		275	275
Base Capacity (vph)	315	2297	1460	261	2800	791	448
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.90	0.13	0.28	0.44	0.20	0.15

Intersection Summary

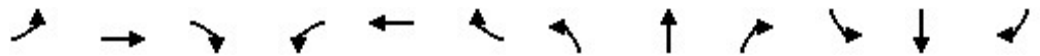
Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 87.7
 Natural Cycle: 100
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 15.5
 Intersection LOS: B
 Intersection Capacity Utilization 69.0%
 ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Carolinian Ave & Knightdale Blvd



Robertson Street Assemblage TIA
 2: Carolinian Ave & Knightdale Station Run

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	21	23	98	4	36	46	60	86	4	39	124	40
Future Volume (vph)	21	23	98	4	36	46	60	86	4	39	124	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.907			0.928			0.997			0.974	
Fl _t Protected		0.993			0.998			0.980			0.991	
Satd. Flow (prot)	0	1678	0	0	1725	0	0	1820	0	0	1798	0
Fl _t Permitted		0.993			0.998			0.980			0.991	
Satd. Flow (perm)	0	1678	0	0	1725	0	0	1820	0	0	1798	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		910			556			1007			1095	
Travel Time (s)		24.8			15.2			27.5			29.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	26	109	4	40	51	67	96	4	43	138	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	158	0	0	95	0	0	167	0	0	225	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.0%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 3: First Ave & Knightdale Station Run

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	102	63	463	133	113	519
Future Volume (vph)	102	63	463	133	113	519
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.970			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1807	0	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1807	0	1770	1863
Link Speed (mph)	25		35			35
Link Distance (ft)	1463		1498			771
Travel Time (s)	39.9		29.2			15.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	113	70	514	148	126	577
Shared Lane Traffic (%)						
Lane Group Flow (vph)	113	70	662	0	126	577
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	54.4%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
3: First Ave & Knightdale Station Run

10/06/2022

Intersection						
Int Delay, s/veh	9.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	102	63	463	133	113	519
Future Vol, veh/h	102	63	463	133	113	519
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	113	70	514	148	126	577

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1417	588	0	0	662	0
Stage 1	588	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	151	509	-	-	927	-
Stage 1	555	-	-	-	-	-
Stage 2	429	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	130	509	-	-	927	-
Mov Cap-2 Maneuver	130	-	-	-	-	-
Stage 1	555	-	-	-	-	-
Stage 2	371	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	74.3	0	1.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	130	509	927
HCM Lane V/C Ratio	-	-	0.872	0.138	0.135
HCM Control Delay (s)	-	-	112	13.2	9.5
HCM Lane LOS	-	-	F	B	A
HCM 95th %tile Q(veh)	-	-	5.6	0.5	0.5

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	12	45	130	11	23	4	93	7	7	4	9	23
Future Volume (vph)	12	45	130	11	23	4	93	7	7	4	9	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.906			0.987			0.991			0.912	
Flt Protected		0.997			0.986			0.959			0.995	
Satd. Flow (prot)	0	1683	0	0	1813	0	0	1770	0	0	1690	0
Flt Permitted		0.997			0.986			0.959			0.995	
Satd. Flow (perm)	0	1683	0	0	1813	0	0	1770	0	0	1690	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1007			1193			1169			1254	
Travel Time (s)		27.5			32.5			31.9			34.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	50	144	12	26	4	103	8	8	4	10	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	207	0	0	42	0	0	119	0	0	40	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	30.8%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 4: Heartland Flyer Drive/Twin Star Lane & Carolinian Ave

10/06/2022

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	45	130	11	23	4	93	7	7	4	9	23
Future Vol, veh/h	12	45	130	11	23	4	93	7	7	4	9	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	50	144	12	26	4	103	8	8	4	10	26

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	30	0	0	194	0	0	218	202	122	208	272	28
Stage 1	-	-	-	-	-	-	148	148	-	52	52	-
Stage 2	-	-	-	-	-	-	70	54	-	156	220	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1583	-	-	1379	-	-	738	694	929	749	635	1047
Stage 1	-	-	-	-	-	-	855	775	-	961	852	-
Stage 2	-	-	-	-	-	-	940	850	-	846	721	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1583	-	-	1379	-	-	702	682	929	727	624	1047
Mov Cap-2 Maneuver	-	-	-	-	-	-	702	682	-	727	624	-
Stage 1	-	-	-	-	-	-	847	768	-	952	844	-
Stage 2	-	-	-	-	-	-	898	842	-	823	715	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			2.2			11.1			9.4		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	712	1583	-	-	1379	-	-	859
HCM Lane V/C Ratio	0.167	0.008	-	-	0.009	-	-	0.047
HCM Control Delay (s)	11.1	7.3	0	-	7.6	0	-	9.4
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.1

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	9	16	29	52	72	15
Future Volume (vph)	9	16	29	52	72	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.913				0.976	
Flt Protected	0.982			0.983		
Satd. Flow (prot)	1670	0	0	1831	1818	0
Flt Permitted	0.982			0.983		
Satd. Flow (perm)	1670	0	0	1831	1818	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	997			2466	1085	
Travel Time (s)	27.2			37.4	16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	18	32	58	80	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	0	0	90	97	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.0%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
5: Marks Creek Rd & Marshall Dr

10/06/2022

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	9	16	29	52	72	15
Future Vol, veh/h	9	16	29	52	72	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	18	32	58	80	17

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	211	89	97	0	0
Stage 1	89	-	-	-	-
Stage 2	122	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	777	969	1496	-	-
Stage 1	934	-	-	-	-
Stage 2	903	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	760	969	1496	-	-
Mov Cap-2 Maneuver	760	-	-	-	-
Stage 1	913	-	-	-	-
Stage 2	903	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	2.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1496	-	882	-	-
HCM Lane V/C Ratio	0.022	-	0.031	-	-
HCM Control Delay (s)	7.5	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	21	27	466	13	35	476
Future Volume (vph)	21	27	466	13	35	476
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.924		0.996			
Flt Protected	0.979					0.997
Satd. Flow (prot)	1685	0	1855	0	0	1857
Flt Permitted	0.979					0.997
Satd. Flow (perm)	1685	0	1855	0	0	1857
Link Speed (mph)	15		35			35
Link Distance (ft)	1616		1292			1498
Travel Time (s)	73.5		25.2			29.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	30	518	14	39	529
Shared Lane Traffic (%)						
Lane Group Flow (vph)	53	0	532	0	0	568
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	63.9%
Analysis Period (min)	15
	ICU Level of Service B

Robertson Street Assemblage TIA
6: First Ave & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	27	466	13	35	476
Future Vol, veh/h	21	27	466	13	35	476
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	30	518	14	39	529

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1132	525	0	0	532
Stage 1	525	-	-	-	-
Stage 2	607	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	225	552	-	-	1036
Stage 1	593	-	-	-	-
Stage 2	544	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	213	552	-	-	1036
Mov Cap-2 Maneuver	213	-	-	-	-
Stage 1	593	-	-	-	-
Stage 2	515	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.2	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	325	1036
HCM Lane V/C Ratio	-	-	0.164	0.038
HCM Control Delay (s)	-	-	18.2	8.6
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1

Robertson Street Assemblage TIA
7: First Ave & Robertson St

10/06/2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	190	128	308	279	176	369
Future Volume (vph)	190	128	308	279	176	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.946		0.936			
Flt Protected	0.971					0.984
Satd. Flow (prot)	1711	0	1744	0	0	1833
Flt Permitted	0.971					0.984
Satd. Flow (perm)	1711	0	1744	0	0	1833
Link Speed (mph)	25		35			35
Link Distance (ft)	1195		1409			1292
Travel Time (s)	32.6		27.4			25.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	211	142	342	310	196	410
Shared Lane Traffic (%)						
Lane Group Flow (vph)	353	0	652	0	0	606
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	90.8%
Analysis Period (min)	15
	ICU Level of Service E

Robertson Street Assemblage TIA
7: First Ave & Robertson St

10/06/2022

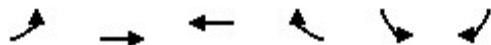
Intersection						
Int Delay, s/veh	100.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Vol, veh/h	190	128	308	279	176	369
Future Vol, veh/h	190	128	308	279	176	369
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	211	142	342	310	196	410

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1299	497	0	0	652
Stage 1	497	-	-	-	-
Stage 2	802	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	~ 178	573	-	-	935
Stage 1	611	-	-	-	-
Stage 2	441	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	~ 130	573	-	-	935
Mov Cap-2 Maneuver	~ 130	-	-	-	-
Stage 1	611	-	-	-	-
Stage 2	321	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	452.7	0	3.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	189	935
HCM Lane V/C Ratio	-	-	1.869	0.209
HCM Control Delay (s)	-	-	452.7	9.9
HCM Lane LOS	-	-	F	A
HCM 95th %tile Q(veh)	-	-	25.7	0.8

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	16	373	304	41	39	13
Future Volume (vph)	16	373	304	41	39	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.984		0.967	
Flt Protected		0.998			0.964	
Satd. Flow (prot)	0	1859	1833	0	1736	0
Flt Permitted		0.998			0.964	
Satd. Flow (perm)	0	1859	1833	0	1736	0
Link Speed (mph)		25	25		25	
Link Distance (ft)		1195	2012		1616	
Travel Time (s)		32.6	54.9		44.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	18	414	338	46	43	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	432	384	0	57	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.6%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 8: Robertson St & Keith St

10/06/2022

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	16	373	304	41	39	13
Future Vol, veh/h	16	373	304	41	39	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	414	338	46	43	14

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	384	0	0	811	361
Stage 1	-	-	-	361	-
Stage 2	-	-	-	450	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1174	-	-	349	684
Stage 1	-	-	-	705	-
Stage 2	-	-	-	642	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1174	-	-	342	684
Mov Cap-2 Maneuver	-	-	-	342	-
Stage 1	-	-	-	691	-
Stage 2	-	-	-	642	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	15.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1174	-	-	-	391
HCM Lane V/C Ratio	0.015	-	-	-	0.148
HCM Control Delay (s)	8.1	0	-	-	15.8
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.5

Robertson Street Assemblage TIA
 9: Site Access 1/Site Access 1A & Robertson St

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	4	339	73	19	313	4	32	4	10	4	4	4
Future Volume (vph)	4	339	73	19	313	4	32	4	10	4	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.976			0.999			0.971			0.955	
Fl _t Protected					0.997			0.966			0.984	
Satd. Flow (prot)	0	1818	0	0	1855	0	0	1747	0	0	1750	0
Fl _t Permitted					0.997			0.966			0.984	
Satd. Flow (perm)	0	1818	0	0	1855	0	0	1747	0	0	1750	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2012			431			1157			209	
Travel Time (s)		39.2			8.4			31.6			5.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	377	81	21	348	4	36	4	11	4	4	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	462	0	0	373	0	0	51	0	0	12	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.6%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 9: Site Access 1/Site Access 1A & Robertson St

10/06/2022

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	339	73	19	313	4	32	4	10	4	4	4
Future Vol, veh/h	4	339	73	19	313	4	32	4	10	4	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	377	81	21	348	4	36	4	11	4	4	4

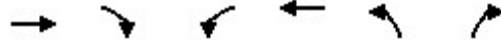
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	352	0	0	458	0	0	822	820	418	825	858	350
Stage 1	-	-	-	-	-	-	426	426	-	392	392	-
Stage 2	-	-	-	-	-	-	396	394	-	433	466	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1207	-	-	1103	-	-	293	310	635	292	294	693
Stage 1	-	-	-	-	-	-	606	586	-	633	606	-
Stage 2	-	-	-	-	-	-	629	605	-	601	562	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1207	-	-	1103	-	-	282	301	635	278	286	693
Mov Cap-2 Maneuver	-	-	-	-	-	-	282	301	-	278	286	-
Stage 1	-	-	-	-	-	-	604	584	-	630	591	-
Stage 2	-	-	-	-	-	-	605	590	-	584	560	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.5			18.2			15.7		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	323	1207	-	-	1103	-	-	351
HCM Lane V/C Ratio	0.158	0.004	-	-	0.019	-	-	0.038
HCM Control Delay (s)	18.2	8	0	-	8.3	0	-	15.7
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0.1	-	-	0.1

Robertson Street Assemblage TIA
 10: Site Access 2 & Robertson St

10/06/2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	340	9	18	327	5	11
Future Volume (vph)	340	9	18	327	5	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997			0.910		
Flt Protected				0.997	0.984	
Satd. Flow (prot)	1857	0	0	1857	1668	0
Flt Permitted				0.997	0.984	
Satd. Flow (perm)	1857	0	0	1857	1668	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	431			605	752	
Travel Time (s)	8.4			11.8	20.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	378	10	20	363	6	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	388	0	0	383	18	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.9%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 10: Site Access 2 & Robertson St

10/06/2022

Intersection						
Int Delay, s/veh	0.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	340	9	18	327	5	11
Future Vol, veh/h	340	9	18	327	5	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	378	10	20	363	6	12

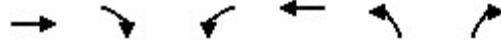
Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	388	0	786 383
Stage 1	-	-	-	-	383 -
Stage 2	-	-	-	-	403 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1170	-	361 664
Stage 1	-	-	-	-	689 -
Stage 2	-	-	-	-	675 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1170	-	353 664
Mov Cap-2 Maneuver	-	-	-	-	353 -
Stage 1	-	-	-	-	689 -
Stage 2	-	-	-	-	661 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	521	-	-	1170	-
HCM Lane V/C Ratio	0.034	-	-	0.017	-
HCM Control Delay (s)	12.2	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Robertson Street Assemblage TIA
 11: Site Access 3 & Robertson St

10/06/2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	324	27	36	318	27	21
Future Volume (vph)	324	27	36	318	27	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	50		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			100		100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.990				0.941	
Flt Protected			0.950		0.972	
Satd. Flow (prot)	1844	0	1770	1863	1704	0
Flt Permitted			0.950		0.972	
Satd. Flow (perm)	1844	0	1770	1863	1704	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	605			535	566	
Travel Time (s)	11.8			10.4	15.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	360	30	40	353	30	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	390	0	40	353	53	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.4%
ICU Level of Service	A
Analysis Period (min)	15

Robertson Street Assemblage TIA
 11: Site Access 3 & Robertson St

10/06/2022

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	324	27	36	318	27	21
Future Vol, veh/h	324	27	36	318	27	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	360	30	40	353	30	23

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	390	0	808 375
Stage 1	-	-	-	-	375 -
Stage 2	-	-	-	-	433 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1169	-	350 671
Stage 1	-	-	-	-	695 -
Stage 2	-	-	-	-	654 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1169	-	338 671
Mov Cap-2 Maneuver	-	-	-	-	338 -
Stage 1	-	-	-	-	695 -
Stage 2	-	-	-	-	632 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	14.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	432	-	-	1169	-
HCM Lane V/C Ratio	0.123	-	-	0.034	-
HCM Control Delay (s)	14.5	-	-	8.2	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Robertson Street Assemblage TIA
 12: Robertson St & Site Access 4

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	12	333	335	4	4	18
Future Volume (vph)	12	333	335	4	4	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999		0.887	
Flt Protected		0.998			0.992	
Satd. Flow (prot)	0	1859	1861	0	1639	0
Flt Permitted		0.998			0.992	
Satd. Flow (perm)	0	1859	1861	0	1639	0
Link Speed (mph)		35	35		10	
Link Distance (ft)		535	213		253	
Travel Time (s)		10.4	4.1		17.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	370	372	4	4	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	383	376	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.2%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 12: Robertson St & Site Access 4

10/06/2022

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	12	333	335	4	4	18
Future Vol, veh/h	12	333	335	4	4	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	370	372	4	4	20

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	376	0	-	0	770 374
Stage 1	-	-	-	-	374 -
Stage 2	-	-	-	-	396 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1182	-	-	-	369 672
Stage 1	-	-	-	-	696 -
Stage 2	-	-	-	-	680 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1182	-	-	-	364 672
Mov Cap-2 Maneuver	-	-	-	-	364 -
Stage 1	-	-	-	-	686 -
Stage 2	-	-	-	-	680 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1182	-	-	-	582
HCM Lane V/C Ratio	0.011	-	-	-	0.042
HCM Control Delay (s)	8.1	0	-	-	11.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Robertson Street Assemblage TIA
 13: Robertson St & Site Access 5

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	12	331	320	8	14	19
Future Volume (vph)	12	331	320	8	14	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.997		0.923	
Flt Protected		0.998			0.979	
Satd. Flow (prot)	0	1859	1857	0	1683	0
Flt Permitted		0.998			0.979	
Satd. Flow (perm)	0	1859	1857	0	1683	0
Link Speed (mph)		35	35		10	
Link Distance (ft)		213	852		269	
Travel Time (s)		4.1	16.6		18.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	368	356	9	16	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	381	365	0	37	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.1%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 13: Robertson St & Site Access 5

10/06/2022

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	12	331	320	8	14	19
Future Vol, veh/h	12	331	320	8	14	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	368	356	9	16	21

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	365	0	-	0	755 361
Stage 1	-	-	-	-	361 -
Stage 2	-	-	-	-	394 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1194	-	-	-	376 684
Stage 1	-	-	-	-	705 -
Stage 2	-	-	-	-	681 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1194	-	-	-	371 684
Mov Cap-2 Maneuver	-	-	-	-	371 -
Stage 1	-	-	-	-	695 -
Stage 2	-	-	-	-	681 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	12.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1194	-	-	-	504
HCM Lane V/C Ratio	0.011	-	-	-	0.073
HCM Control Delay (s)	8	0	-	-	12.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Robertson Street Assemblage TIA

14: Mailman Rd/Site Access 6 & Robertson St/Knightdale Eagle Rock Rd

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	11	280	30	40	289	9	24	4	51	13	6	20
Future Volume (vph)	11	280	30	40	289	9	24	4	51	13	6	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.987			0.996			0.913			0.931	
Fl _t Protected		0.998			0.994			0.985			0.984	
Satd. Flow (prot)	0	1835	0	0	1844	0	0	1675	0	0	1706	0
Fl _t Permitted		0.998			0.994			0.985			0.984	
Satd. Flow (perm)	0	1835	0	0	1844	0	0	1675	0	0	1706	0
Link Speed (mph)		35			45			55			10	
Link Distance (ft)		852			285			807			349	
Travel Time (s)		16.6			4.3			10.0			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	12	311	33	44	321	10	27	4	57	14	7	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	356	0	0	375	0	0	88	0	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	280	30	40	289	9	24	4	51	13	6	20
Future Vol, veh/h	11	280	30	40	289	9	24	4	51	13	6	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	311	33	44	321	10	27	4	57	14	7	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	331	0	0	344	0	0	781	771	328	796	782	326
Stage 1	-	-	-	-	-	-	352	352	-	414	414	-
Stage 2	-	-	-	-	-	-	429	419	-	382	368	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1228	-	-	1215	-	-	312	331	713	305	326	715
Stage 1	-	-	-	-	-	-	665	632	-	616	593	-
Stage 2	-	-	-	-	-	-	604	590	-	640	621	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1228	-	-	1215	-	-	285	313	713	266	308	715
Mov Cap-2 Maneuver	-	-	-	-	-	-	285	313	-	266	308	-
Stage 1	-	-	-	-	-	-	657	624	-	609	567	-
Stage 2	-	-	-	-	-	-	553	564	-	578	614	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			1			14.4			15		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	469	1228	-	-	1215	-	-	405
HCM Lane V/C Ratio	0.187	0.01	-	-	0.037	-	-	0.107
HCM Control Delay (s)	14.4	8	0	-	8.1	0	-	15
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	0.4

Robertson Street Assemblage TIA
 15: Knightdale Eagle Rock Rd & Site Access 7

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	11	341	312	9	13	19
Future Volume (vph)	11	341	312	9	13	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.996		0.919	
Flt Protected		0.998			0.980	
Satd. Flow (prot)	0	1859	1855	0	1678	0
Flt Permitted		0.998			0.980	
Satd. Flow (perm)	0	1859	1855	0	1678	0
Link Speed (mph)		45	45		10	
Link Distance (ft)		285	1096		338	
Travel Time (s)		4.3	16.6		23.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	12	379	347	10	14	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	391	357	0	35	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Stop	Stop		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.8%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	52	302	261	28	37	60
Future Volume (vph)	52	302	261	28	37	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.987		0.916	
Flt Protected		0.993			0.981	
Satd. Flow (prot)	0	1850	1839	0	1674	0
Flt Permitted		0.993			0.981	
Satd. Flow (perm)	0	1850	1839	0	1674	0
Link Speed (mph)		45	45		45	
Link Distance (ft)		1096	1080		2466	
Travel Time (s)		16.6	16.4		37.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	58	336	290	31	41	67
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	394	321	0	108	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.9%
Analysis Period (min)	15
	ICU Level of Service A

Robertson Street Assemblage TIA
 16: Knightdale Eagle Rock Rd & Marks Creek Rd

10/06/2022

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	52	302	261	28	37	60
Future Vol, veh/h	52	302	261	28	37	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	58	336	290	31	41	67

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	321	0	-	0	758 306
Stage 1	-	-	-	-	306 -
Stage 2	-	-	-	-	452 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1239	-	-	-	375 734
Stage 1	-	-	-	-	747 -
Stage 2	-	-	-	-	641 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1239	-	-	-	353 734
Mov Cap-2 Maneuver	-	-	-	-	353 -
Stage 1	-	-	-	-	704 -
Stage 2	-	-	-	-	641 -

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1239	-	-	-	520
HCM Lane V/C Ratio	0.047	-	-	-	0.207
HCM Control Delay (s)	8	0	-	-	13.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8

Robertson Street Assemblage TIA
17: Smithfield Rd & First Ave

10/06/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	300	269	15	123	376	57	12	370	81	51	453	399
Future Volume (vph)	300	269	15	123	376	57	12	370	81	51	453	399
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			-2%			8%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.986			0.976			0.940	
Flt Protected		0.975			0.989			0.999			0.997	
Satd. Flow (prot)	0	1791	0	0	1835	0	0	1834	0	0	1676	0
Flt Permitted		0.493			0.766			0.967			0.919	
Satd. Flow (perm)	0	906	0	0	1421	0	0	1776	0	0	1545	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1108			1409			1184			1107	
Travel Time (s)		30.2			38.4			23.1			21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	333	299	17	137	418	63	13	411	90	57	503	443
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	649	0	0	618	0	0	514	0	0	1003	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	0.99	0.99	0.99	0.99	0.99	0.99	1.05	1.05	1.05
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	73.0	73.0		73.0	73.0		67.0	67.0		67.0	67.0	
Total Split (%)	52.1%	52.1%		52.1%	52.1%		47.9%	47.9%		47.9%	47.9%	
Maximum Green (s)	68.5	68.5		68.2	68.2		61.8	61.8		61.9	61.9	
Yellow Time (s)	3.1	3.1		3.3	3.3		4.0	4.0		3.4	3.4	
All-Red Time (s)	1.4	1.4		1.5	1.5		1.2	1.2		1.7	1.7	
Lost Time Adjust (s)		0.5			0.2			-0.2			-0.1	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		68.0			68.0			62.0			62.0	
Actuated g/C Ratio		0.49			0.49			0.44			0.44	
v/c Ratio		1.48			0.90			0.65			1.47	

Robertson Street Assemblage TIA
 17: Smithfield Rd & First Ave

10/06/2022

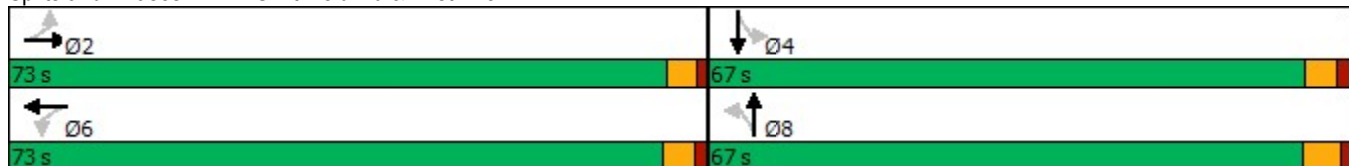


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		255.4			50.2			35.5				249.0
Queue Delay		0.0			0.0			0.0				0.0
Total Delay		255.4			50.2			35.5				249.0
LOS		F			D			D				F
Approach Delay		255.4			50.2			35.5				249.0
Approach LOS		F			D			D				F
Queue Length 50th (ft)		~811			502			362				~1249
Queue Length 95th (ft)		#1051			#752			492				#1508
Internal Link Dist (ft)		1028			1329			1104				1027
Turn Bay Length (ft)												
Base Capacity (vph)		440			690			786				684
Starvation Cap Reductn		0			0			0				0
Spillback Cap Reductn		0			0			0				0
Storage Cap Reductn		0			0			0				0
Reduced v/c Ratio		1.48			0.90			0.65				1.47

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Natural Cycle:	140
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.48
Intersection Signal Delay:	166.9
Intersection LOS:	F
Intersection Capacity Utilization:	147.4%
ICU Level of Service:	H
Analysis Period (min):	15
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 17: Smithfield Rd & First Ave



MOVEMENT SUMMARY

Site: 2 [Knightdale Station Run / Carolinian Ave (Site Folder: Robertson St TIA)]

2038 Build AM Peak Hour
 Site Category: Future Conditions 1
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Carolinian Ave														
3	L2	71	2.0	79	2.0	0.326	8.5	LOS A	1.5	38.2	0.64	0.63	0.64	23.5
8	T1	132	2.0	147	2.0	0.326	8.5	LOS A	1.5	38.2	0.64	0.63	0.64	23.1
18	R2	23	2.0	26	2.0	0.326	8.5	LOS A	1.5	38.2	0.64	0.63	0.64	22.6
Approach		226	2.0	251	2.0	0.326	8.5	LOS A	1.5	38.2	0.64	0.63	0.64	23.2
East: Knightdale Station Run														
1	L2	11	2.0	12	2.0	0.431	8.2	LOS A	2.5	64.1	0.54	0.42	0.54	23.8
6	T1	129	2.0	143	2.0	0.431	8.2	LOS A	2.5	64.1	0.54	0.42	0.54	23.4
16	R2	263	2.0	292	2.0	0.431	8.2	LOS A	2.5	64.1	0.54	0.42	0.54	22.9
Approach		403	2.0	448	2.0	0.431	8.2	LOS A	2.5	64.1	0.54	0.42	0.54	23.1
North: Carolinian Ave														
7	L2	258	2.0	287	2.0	0.347	6.9	LOS A	1.9	47.7	0.48	0.36	0.48	23.3
4	T1	51	2.0	57	2.0	0.347	6.9	LOS A	1.9	47.7	0.48	0.36	0.48	23.0
14	R2	22	2.0	24	2.0	0.347	6.9	LOS A	1.9	47.7	0.48	0.36	0.48	22.5
Approach		331	2.0	368	2.0	0.347	6.9	LOS A	1.9	47.7	0.48	0.36	0.48	23.2
West: Knightdale Station Run														
5	L2	25	2.0	28	2.0	0.309	7.1	LOS A	1.5	38.7	0.55	0.47	0.55	24.1
2	T1	203	2.0	226	2.0	0.309	7.1	LOS A	1.5	38.7	0.55	0.47	0.55	23.7
12	R2	32	2.0	36	2.0	0.309	7.1	LOS A	1.5	38.7	0.55	0.47	0.55	23.2
Approach		260	2.0	289	2.0	0.309	7.1	LOS A	1.5	38.7	0.55	0.47	0.55	23.7
All Vehicles		1220	2.0	1356	2.0	0.431	7.7	LOS A	2.5	64.1	0.54	0.45	0.54	23.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 9 [Robertson St / Site Access 1 / Site Access 1A (Site Folder: Robertson St TIA)]

2038 Build AM Peak Hour
 Site Category: Future Conditions 1
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Site Access 1														
3	L2	50	2.0	56	2.0	0.072	4.0	LOS A	0.3	7.7	0.36	0.22	0.36	24.1
8	T1	4	2.0	4	2.0	0.072	4.0	LOS A	0.3	7.7	0.36	0.22	0.36	23.7
18	R2	16	2.0	18	2.0	0.072	4.0	LOS A	0.3	7.7	0.36	0.22	0.36	23.2
Approach		70	2.0	78	2.0	0.072	4.0	LOS A	0.3	7.7	0.36	0.22	0.36	23.8
East: Robertson Street														
1	L2	6	2.0	7	2.0	0.272	5.3	LOS A	1.5	37.6	0.23	0.10	0.23	24.7
6	T1	300	2.0	333	2.0	0.272	5.3	LOS A	1.5	37.6	0.23	0.10	0.23	24.3
16	R2	4	2.0	4	2.0	0.272	5.3	LOS A	1.5	37.6	0.23	0.10	0.23	23.7
Approach		310	2.0	344	2.0	0.272	5.3	LOS A	1.5	37.6	0.23	0.10	0.23	24.3
North: Site Access 1A														
7	L2	4	2.0	4	2.0	0.015	4.2	LOS A	0.1	1.5	0.46	0.30	0.46	24.5
4	T1	4	2.0	4	2.0	0.015	4.2	LOS A	0.1	1.5	0.46	0.30	0.46	24.1
14	R2	4	2.0	4	2.0	0.015	4.2	LOS A	0.1	1.5	0.46	0.30	0.46	23.6
Approach		12	2.0	13	2.0	0.015	4.2	LOS A	0.1	1.5	0.46	0.30	0.46	24.0
West: Robertson Street														
5	L2	4	2.0	4	2.0	0.181	4.2	LOS A	0.9	22.9	0.09	0.02	0.09	25.0
2	T1	191	2.0	212	2.0	0.181	4.2	LOS A	0.9	22.9	0.09	0.02	0.09	24.5
12	R2	22	2.0	24	2.0	0.181	4.2	LOS A	0.9	22.9	0.09	0.02	0.09	24.0
Approach		217	2.0	241	2.0	0.181	4.2	LOS A	0.9	22.9	0.09	0.02	0.09	24.5
All Vehicles		609	2.0	677	2.0	0.272	4.7	LOS A	1.5	37.6	0.20	0.09	0.20	24.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Knightdale Station Run / Carolinian Ave (Site Folder: Robertson St TIA)]

2038 Build PM Peak Hour
 Site Category: Future Conditions 1
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Carolinian Ave														
3	L2	60	2.0	67	2.0	0.136	4.1	LOS A	0.6	15.9	0.24	0.11	0.24	24.5
8	T1	86	2.0	96	2.0	0.136	4.1	LOS A	0.6	15.9	0.24	0.11	0.24	24.1
18	R2	4	2.0	4	2.0	0.136	4.1	LOS A	0.6	15.9	0.24	0.11	0.24	23.6
Approach		150	2.0	167	2.0	0.136	4.1	LOS A	0.6	15.9	0.24	0.11	0.24	24.2
East: Knightdale Station Run														
1	L2	4	2.0	4	2.0	0.086	4.0	LOS A	0.4	9.4	0.33	0.20	0.33	24.9
6	T1	36	2.0	40	2.0	0.086	4.0	LOS A	0.4	9.4	0.33	0.20	0.33	24.5
16	R2	46	2.0	51	2.0	0.086	4.0	LOS A	0.4	9.4	0.33	0.20	0.33	23.9
Approach		86	2.0	96	2.0	0.086	4.0	LOS A	0.4	9.4	0.33	0.20	0.33	24.2
North: Carolinian Ave														
7	L2	39	2.0	43	2.0	0.187	4.6	LOS A	0.9	23.0	0.28	0.15	0.28	24.6
4	T1	124	2.0	138	2.0	0.187	4.6	LOS A	0.9	23.0	0.28	0.15	0.28	24.2
14	R2	40	2.0	44	2.0	0.187	4.6	LOS A	0.9	23.0	0.28	0.15	0.28	23.7
Approach		203	2.0	226	2.0	0.187	4.6	LOS A	0.9	23.0	0.28	0.15	0.28	24.2
West: Knightdale Station Run														
5	L2	21	2.0	23	2.0	0.141	4.5	LOS A	0.6	16.2	0.35	0.22	0.35	24.6
2	T1	23	2.0	26	2.0	0.141	4.5	LOS A	0.6	16.2	0.35	0.22	0.35	24.2
12	R2	98	2.0	109	2.0	0.141	4.5	LOS A	0.6	16.2	0.35	0.22	0.35	23.6
Approach		142	2.0	158	2.0	0.141	4.5	LOS A	0.6	16.2	0.35	0.22	0.35	23.9
All Vehicles		581	2.0	646	2.0	0.187	4.3	LOS A	0.9	23.0	0.30	0.16	0.30	24.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 9 [Robertson St / Site Access 1 / Site Access 1A (Site Folder: Robertson St TIA)]

2038 Build PM Peak Hour
 Site Category: Future Conditions 1
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] ft				
South: Site Access 1														
3	L2	32	2.0	36	2.0	0.053	4.5	LOS A	0.2	5.4	0.47	0.35	0.47	23.9
8	T1	1	2.0	1	2.0	0.053	4.5	LOS A	0.2	5.4	0.47	0.35	0.47	23.5
18	R2	10	2.0	11	2.0	0.053	4.5	LOS A	0.2	5.4	0.47	0.35	0.47	23.0
Approach		43	2.0	48	2.0	0.053	4.5	LOS A	0.2	5.4	0.47	0.35	0.47	23.7
East: Robertson Street														
1	L2	19	2.0	21	2.0	0.292	5.4	LOS A	1.6	41.9	0.18	0.07	0.18	24.6
6	T1	318	2.0	353	2.0	0.292	5.4	LOS A	1.6	41.9	0.18	0.07	0.18	24.2
16	R2	4	2.0	4	2.0	0.292	5.4	LOS A	1.6	41.9	0.18	0.07	0.18	23.7
Approach		341	2.0	379	2.0	0.292	5.4	LOS A	1.6	41.9	0.18	0.07	0.18	24.2
North: Site Access 1A														
7	L2	4	2.0	4	2.0	0.011	4.2	LOS A	0.0	1.1	0.47	0.30	0.47	24.3
4	T1	1	2.0	1	2.0	0.011	4.2	LOS A	0.0	1.1	0.47	0.30	0.47	23.9
14	R2	4	2.0	4	2.0	0.011	4.2	LOS A	0.0	1.1	0.47	0.30	0.47	23.4
Approach		9	2.0	10	2.0	0.011	4.2	LOS A	0.0	1.1	0.47	0.30	0.47	23.9
West: Robertson Street														
5	L2	4	2.0	4	2.0	0.355	6.0	LOS A	2.2	56.0	0.16	0.05	0.16	24.5
2	T1	344	2.0	382	2.0	0.355	6.0	LOS A	2.2	56.0	0.16	0.05	0.16	24.1
12	R2	73	2.0	81	2.0	0.355	6.0	LOS A	2.2	56.0	0.16	0.05	0.16	23.5
Approach		421	2.0	468	2.0	0.355	6.0	LOS A	2.2	56.0	0.16	0.05	0.16	24.0
All Vehicles		814	2.0	904	2.0	0.355	5.6	LOS A	2.2	56.0	0.19	0.08	0.19	24.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

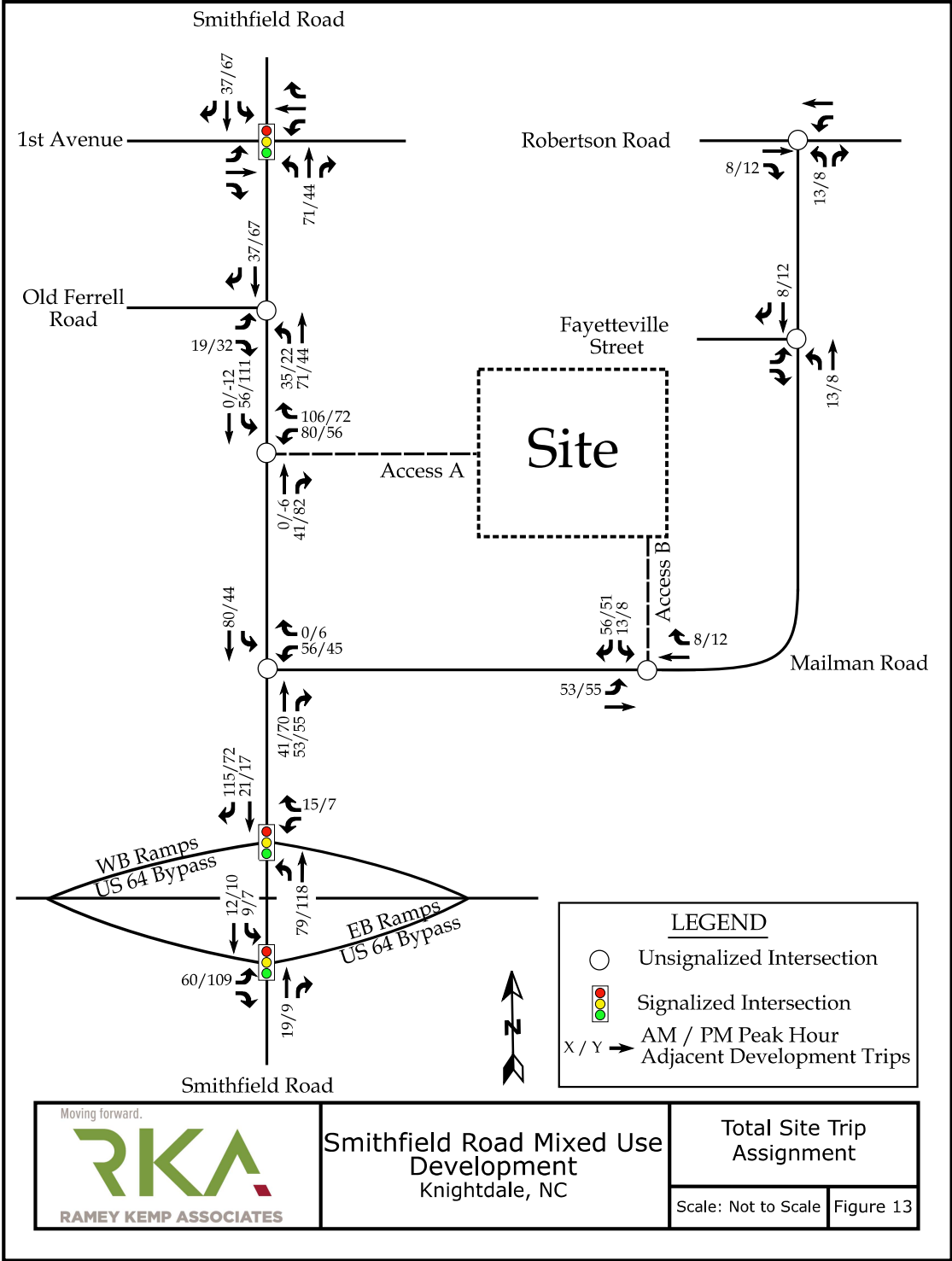
Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix E – Approved Area Developments





Memorandum

To: Michael Foley
MF Development LLC
5448 Apex Peakway
Apex, North Carolina 27502

Date: September 3, 2019

Project #: 38930.01

From: Andrew Topp, PE, PTOE

Re: The Collection – Trip Generation Memorandum

MF Development LLC requested VHB perform a trip generation calculation for a new housing development at 614 Keith Street in Knightdale, NC. Based on the sketch plan prepared by McAdams dated August 2, 2019, the proposed development is expected to consist of 57 single-family homes and 32 townhomes. The ITE Trip Generation Manual, 10th Edition was utilized to calculate the expected weekday trips during the AM and PM peak hours. The trip generation results for the proposed housing development are located in Table 1.

Table 1: Trip Generation Results

Table with 10 columns: Land Use Code, Land Use, Unit, ADT, AM Peak Hour (Enter, Exit, Total), PM Peak Hour (Enter, Exit, Total). Rows include Single-Family Detached Housing, Multifamily Housing (Low-Rise), and a Development Total row.

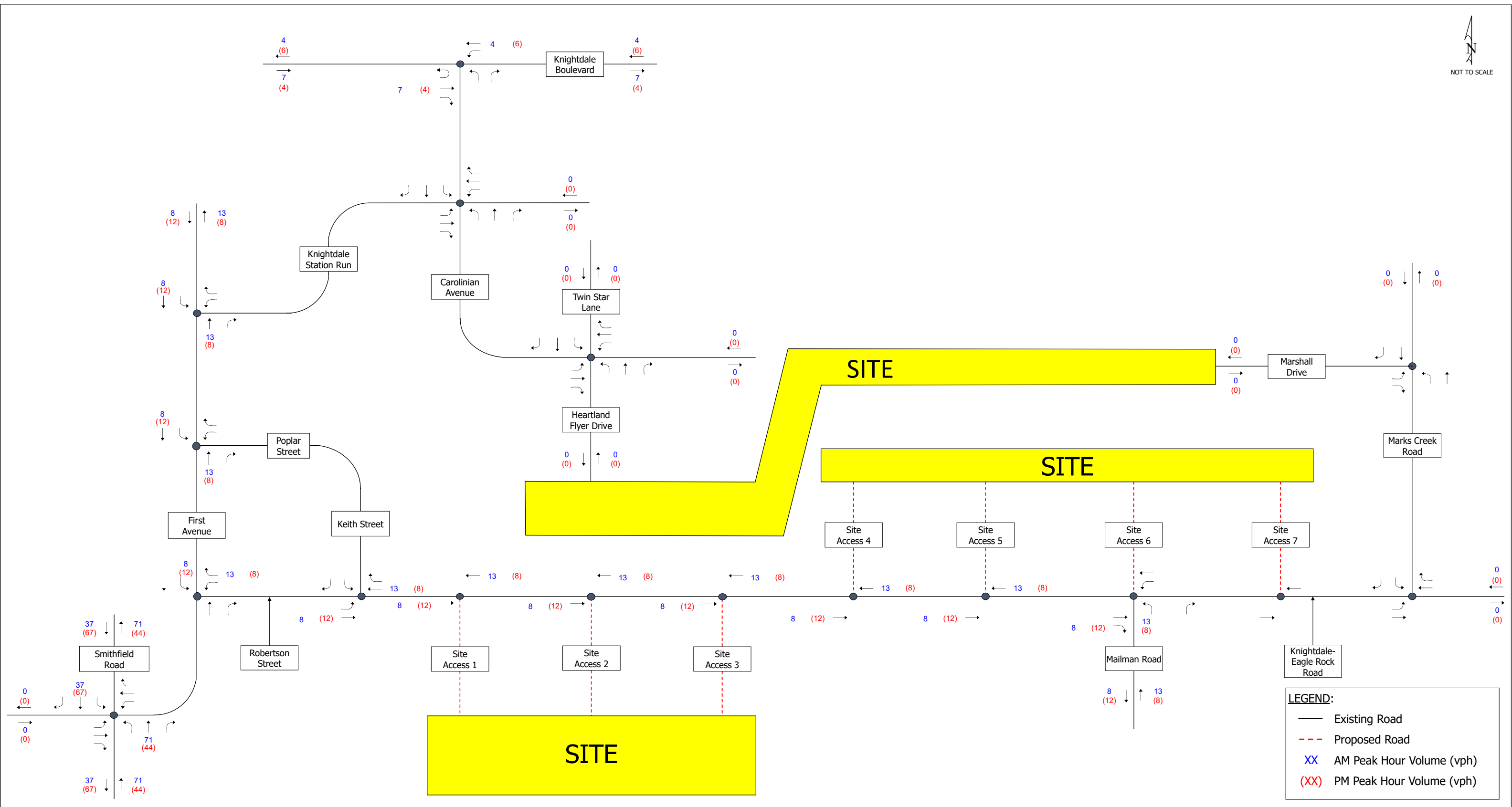
Notes:

- 1. Land Use Code and trip generation rates are determined based on ITE Trip Generation, 10th Edition
2. Total site trips are determined based on the suggested method in the NCDOT Rate Vs Equation Spreadsheet

As shown in Table 1, the development is expected to generate 821 daily trips with 61 trips (15 entering, 46 exiting) occurring during the AM peak hour, and 80 trips (50 entering, 30 exiting) occurring during the PM peak hour.

The Town of Knightdale requires a Traffic Impact Analysis (TIA) for any development that is expected to generate at least 150 trips during one peak hour. This development will generate a maximum of 80 trips during a single peak hour. Therefore, since the maximum number of generated peak hour site trips is less than 150, a TIA is not required for this development.

VHB Engineering NC, P.C.
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

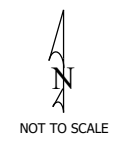


LEGEND:
 — Existing Road
 - - - Proposed Road
 XX AM Peak Hour Volume (vph)
 (XX) PM Peak Hour Volume (vph)

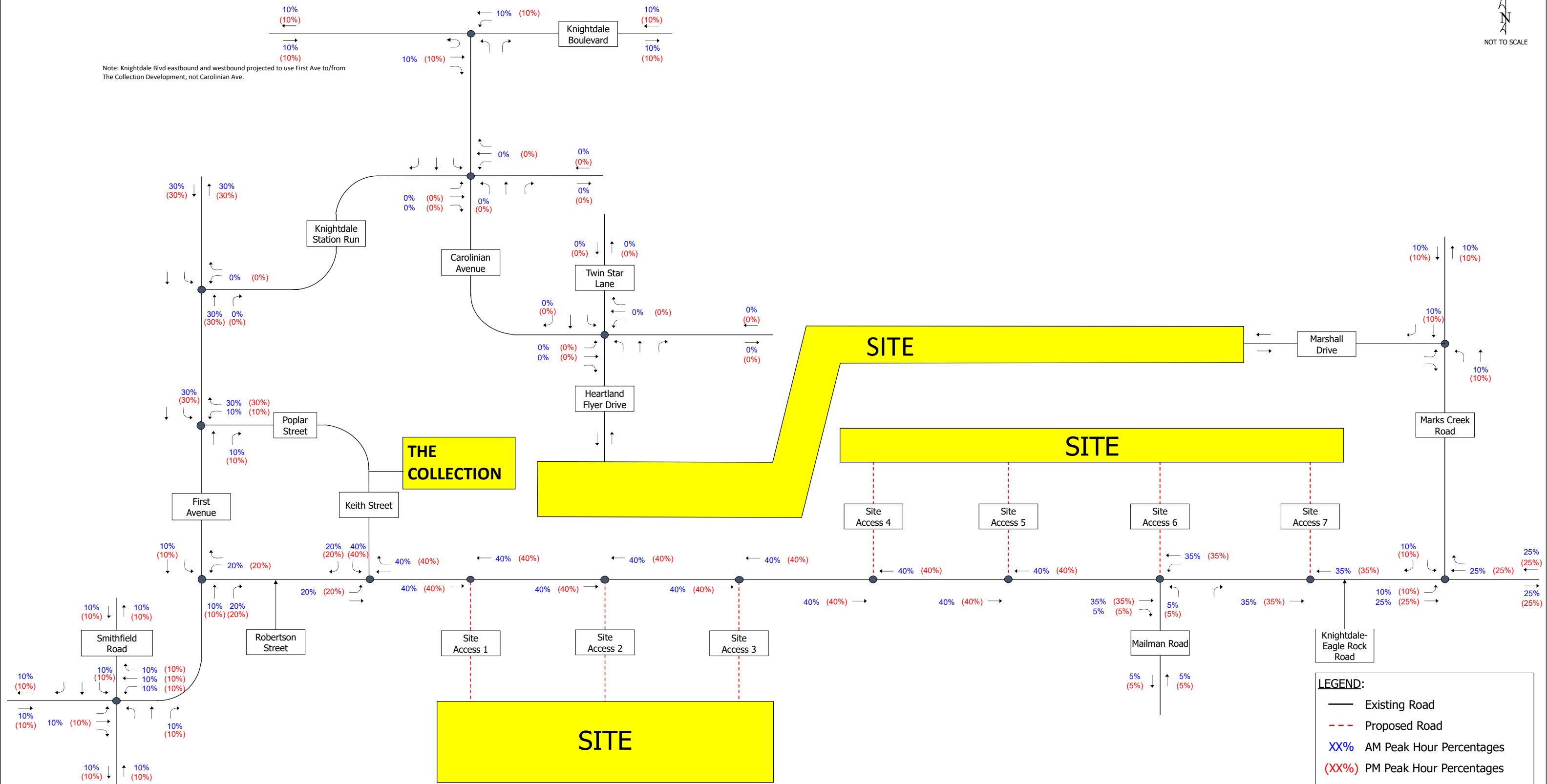


Robertson Street Assemblage Traffic Impact Analysis
 Smithfield Mixed Use Development Traffic Volumes

Figure D-1



Note: Knightdale Blvd eastbound and westbound projected to use First Ave to/from The Collection Development, not Carolinian Ave.



LEGEND:

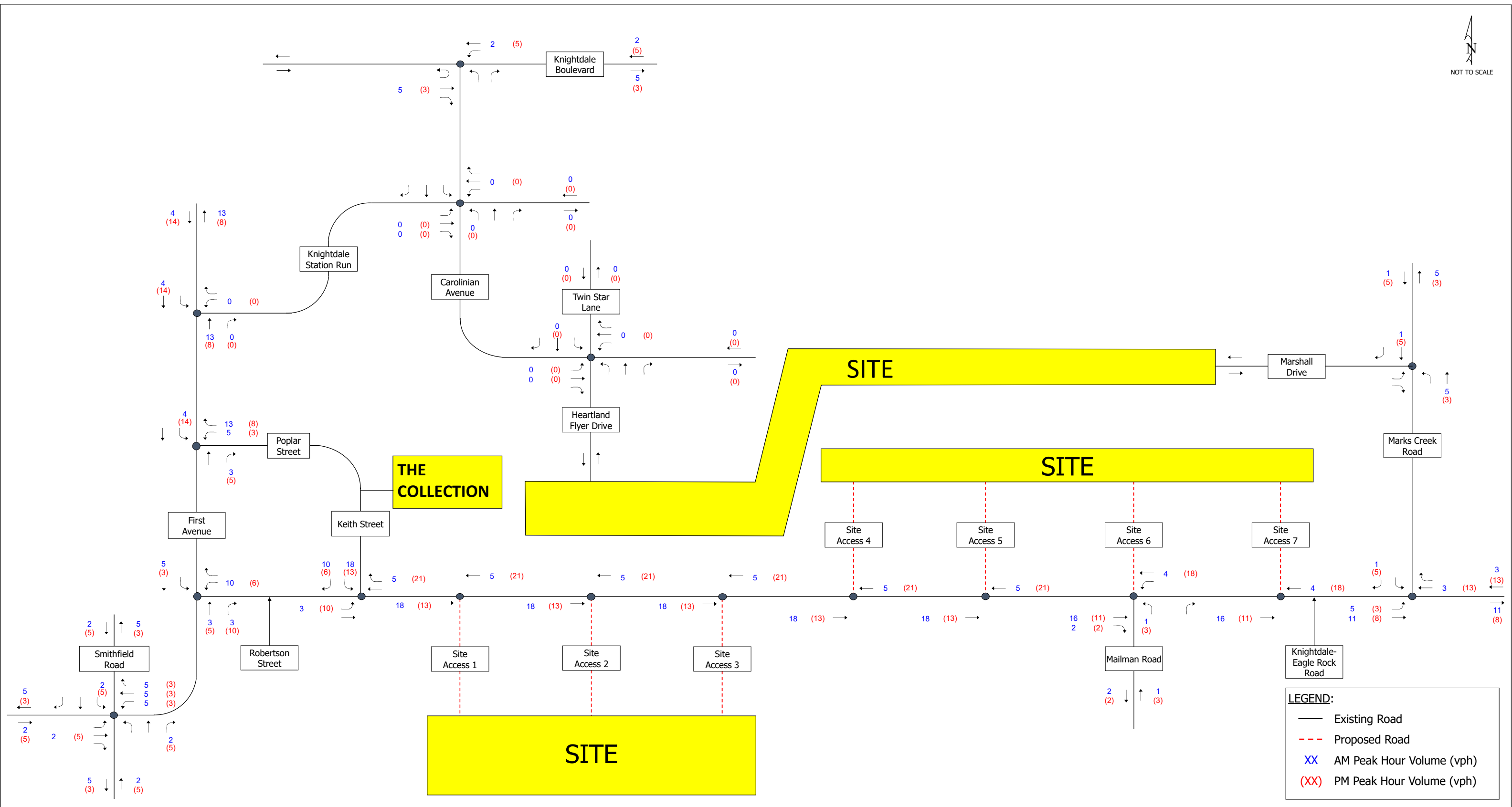
- Existing Road
- - - Proposed Road
- XX% AM Peak Hour Percentages
- (XX%) PM Peak Hour Percentages



Robertson Street Assemblage Traffic Impact Analysis

The Collection Development Trip Distribution Percentages

Figure D-2A



Appendix F – NCDOT Nomographs

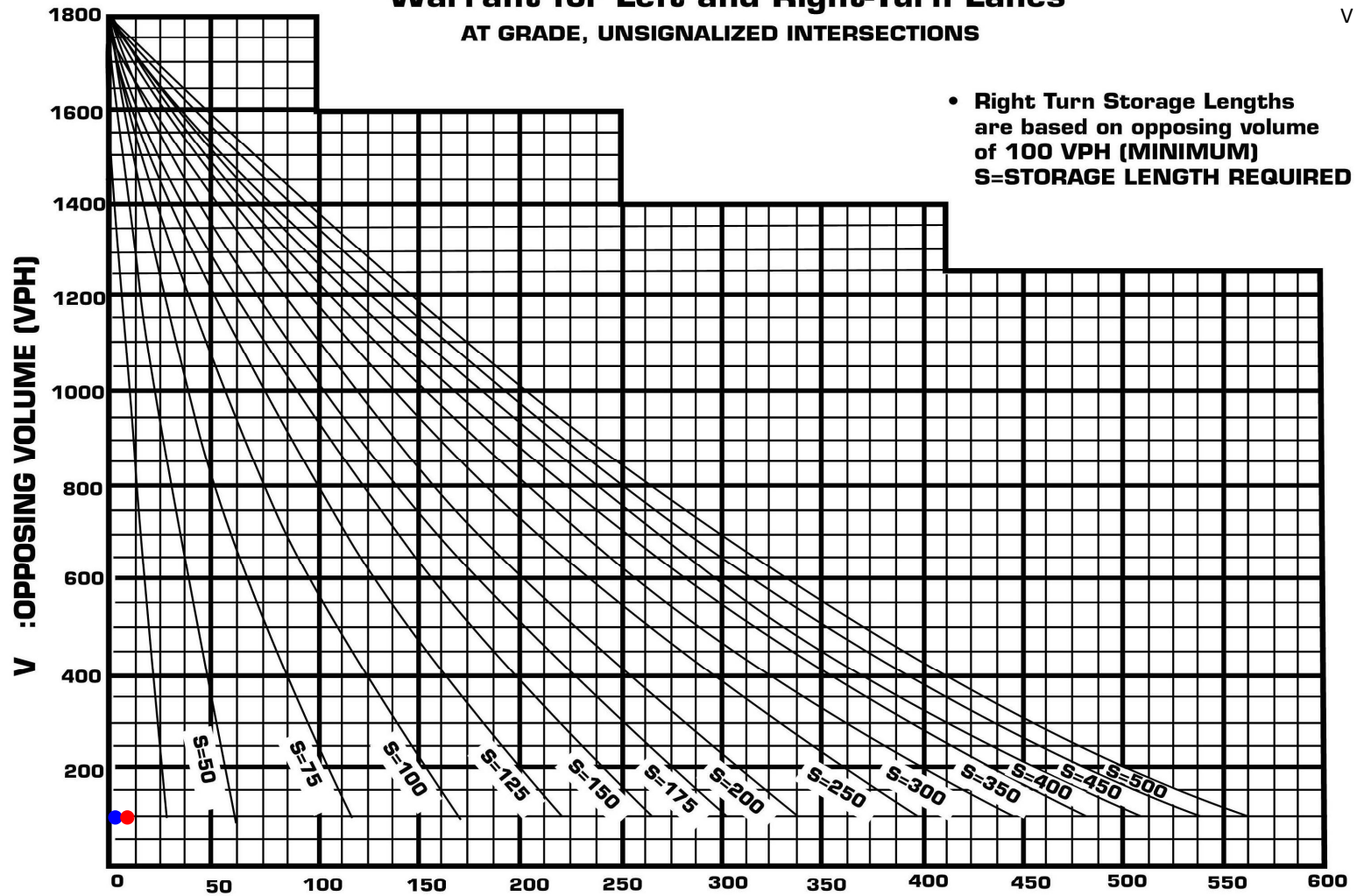
AM Peak Hour

VR = 3
V = 100

PM Peak Hour

VR = 9
V = 100

Warrant for Left and Right-Turn Lanes AT GRADE, UNSIGNALIZED INTERSECTIONS



- Right Turn Storage Lengths are based on opposing volume of 100 VPH (MINIMUM)
S=STORAGE LENGTH REQUIRED

Policy On Street And Driveway Access to North Carolina Highways

V_L: LEFT TURNING VOLUME (VPH)
V_R: RIGHT TURNING VOLUME (VPH)

Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.

Robertson Street / Site Access 2
Eastbound Right-Turn
2028 Build AM and PM Peak Hours

LEGEND

- = AM Peak
- = PM Peak

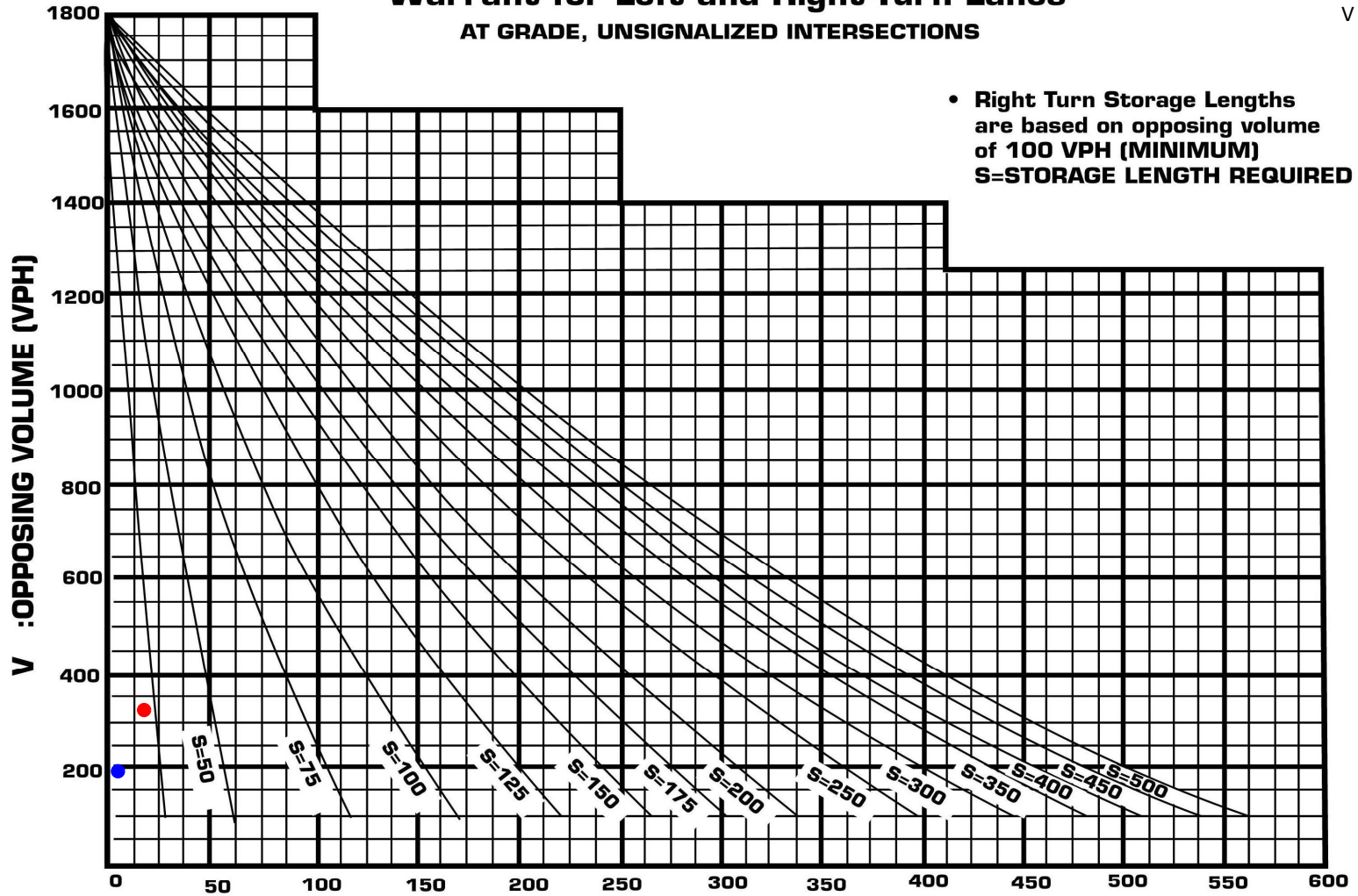
AM Peak Hour

VL = 5
V = 197

PM Peak Hour

VL = 18
V = 327

Warrant for Left and Right-Turn Lanes AT GRADE, UNSIGNALIZED INTERSECTIONS



- Right Turn Storage Lengths are based on opposing volume of 100 VPH (MINIMUM)
- S=STORAGE LENGTH REQUIRED

Policy On Street And Driveway Access to North Carolina Highways

V_L: LEFT TURNING VOLUME (VPH)
V_R: RIGHT TURNING VOLUME (VPH)

Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.

Robertson Street / Site Access 2
Westbound Left-Turn
2028 Build AM and PM Peak Hours

LEGEND

- = AM Peak
- = PM Peak

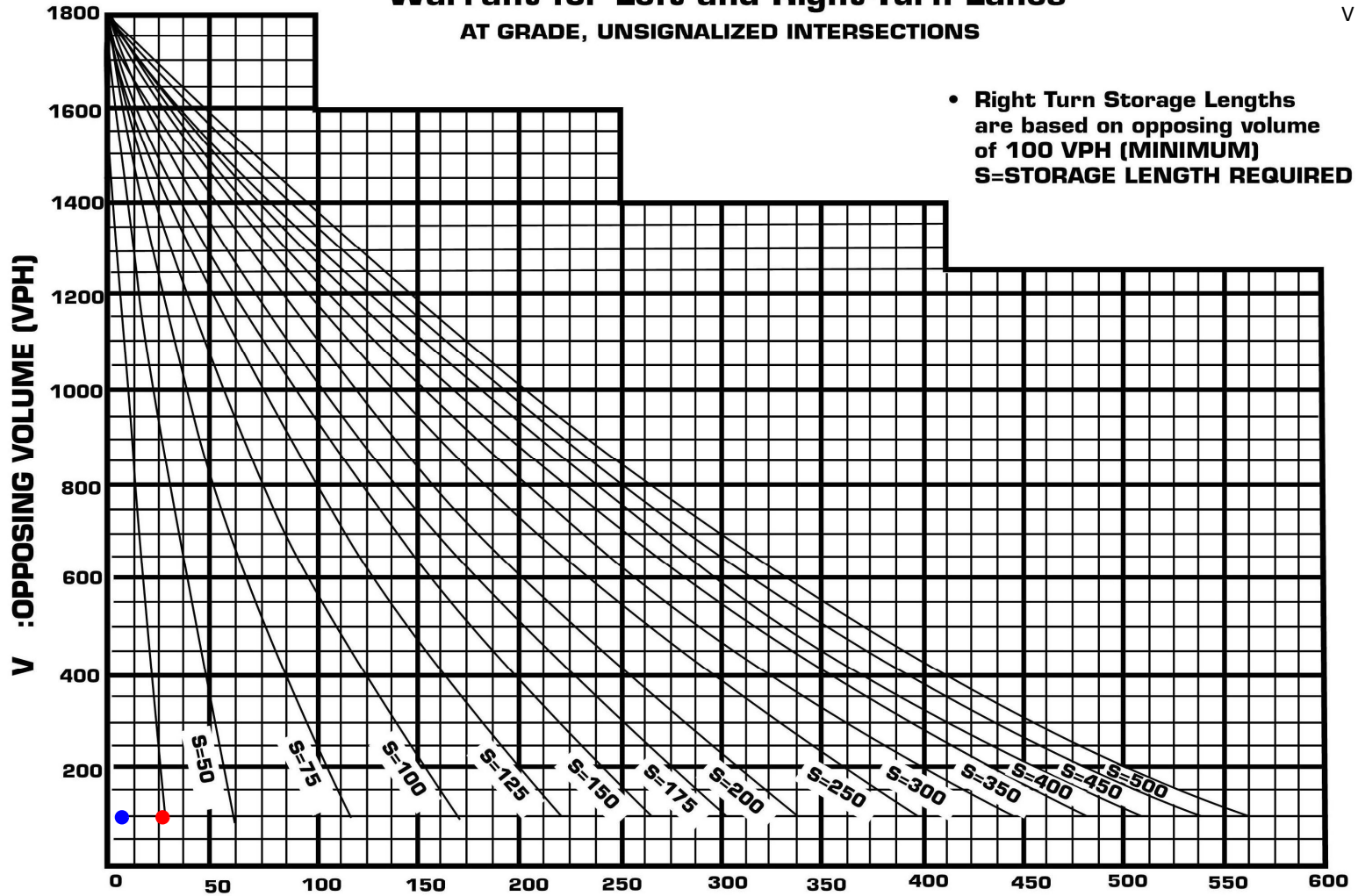
AM Peak Hour

VR = 7
V = 100

PM Peak Hour

VR = 27
V = 100

Warrant for Left and Right-Turn Lanes AT GRADE, UNSIGNALIZED INTERSECTIONS



- Right Turn Storage Lengths are based on opposing volume of 100 VPH (MINIMUM)
S=STORAGE LENGTH REQUIRED

Policy On Street And Driveway Access to North Carolina Highways

V_L: LEFT TURNING VOLUME (VPH)
V_R: RIGHT TURNING VOLUME (VPH)

Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.

Robertson Street / Site Access 3
Eastbound Right-Turn
2028 Build AM and PM Peak Hours

LEGEND

- = AM Peak
- = PM Peak

AM Peak Hour

VL = 11

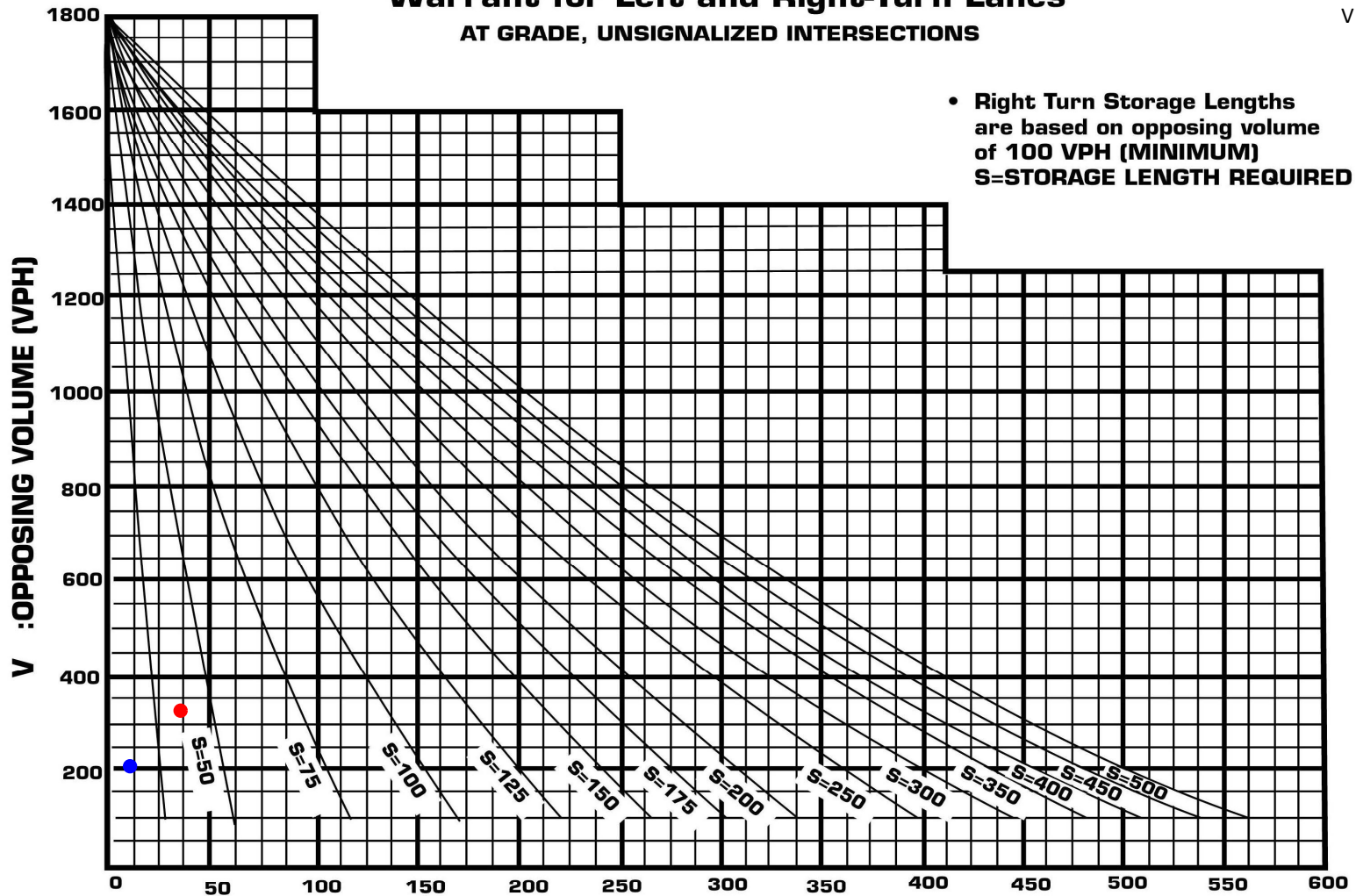
V = 211

PM Peak Hour

VL = 36

V = 329

Warrant for Left and Right-Turn Lanes AT GRADE, UNSIGNALIZED INTERSECTIONS



- Right Turn Storage Lengths are based on opposing volume of 100 VPH (MINIMUM)
S=STORAGE LENGTH REQUIRED

Policy On Street And Driveway Access to North Carolina Highways

V_L: LEFT TURNING VOLUME (VPH)
 V_R: RIGHT TURNING VOLUME (VPH)

Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.

Robertson Street / Site Access 3
 Westbound Left-Turn
 2028 Build AM and PM Peak Hours

LEGEND
 ● = AM Peak
 ● = PM Peak

AM Peak Hour

VL = 12

V = 250

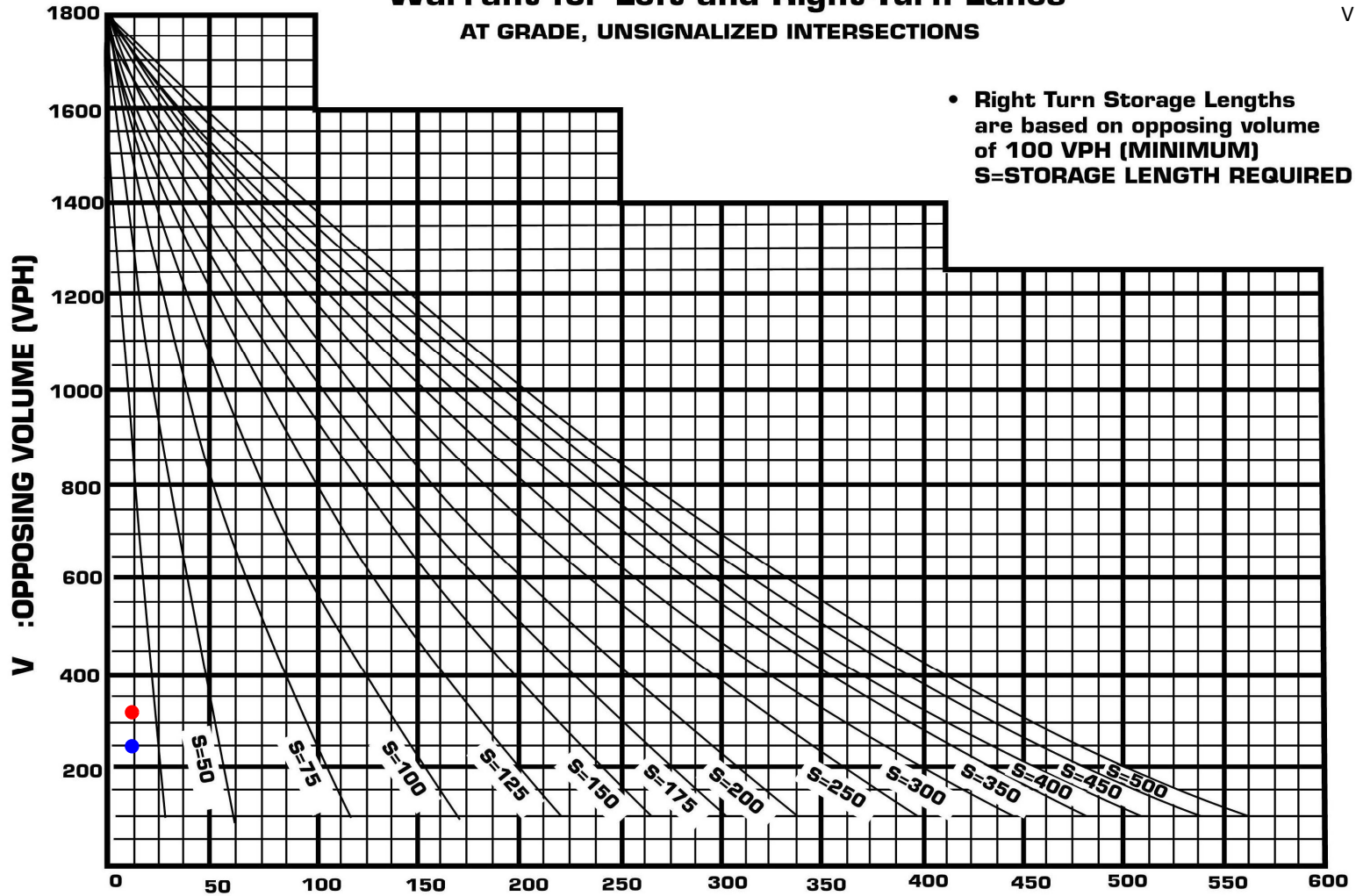
PM Peak Hour

VL = 12

V = 322

Warrant for Left and Right-Turn Lanes

AT GRADE, UNSIGNALIZED INTERSECTIONS



- Right Turn Storage Lengths are based on opposing volume of 100 VPH (MINIMUM)
S=STORAGE LENGTH REQUIRED

Policy On Street And Driveway Access to North Carolina Highways

V_L : LEFT TURNING VOLUME (VPH)
 V_R : RIGHT TURNING VOLUME (VPH)

Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.

Robertson Street / Site Access 4
 Eastbound Left-Turn
 2028 Build AM and PM Peak Hours

LEGEND

- = AM Peak
- = PM Peak

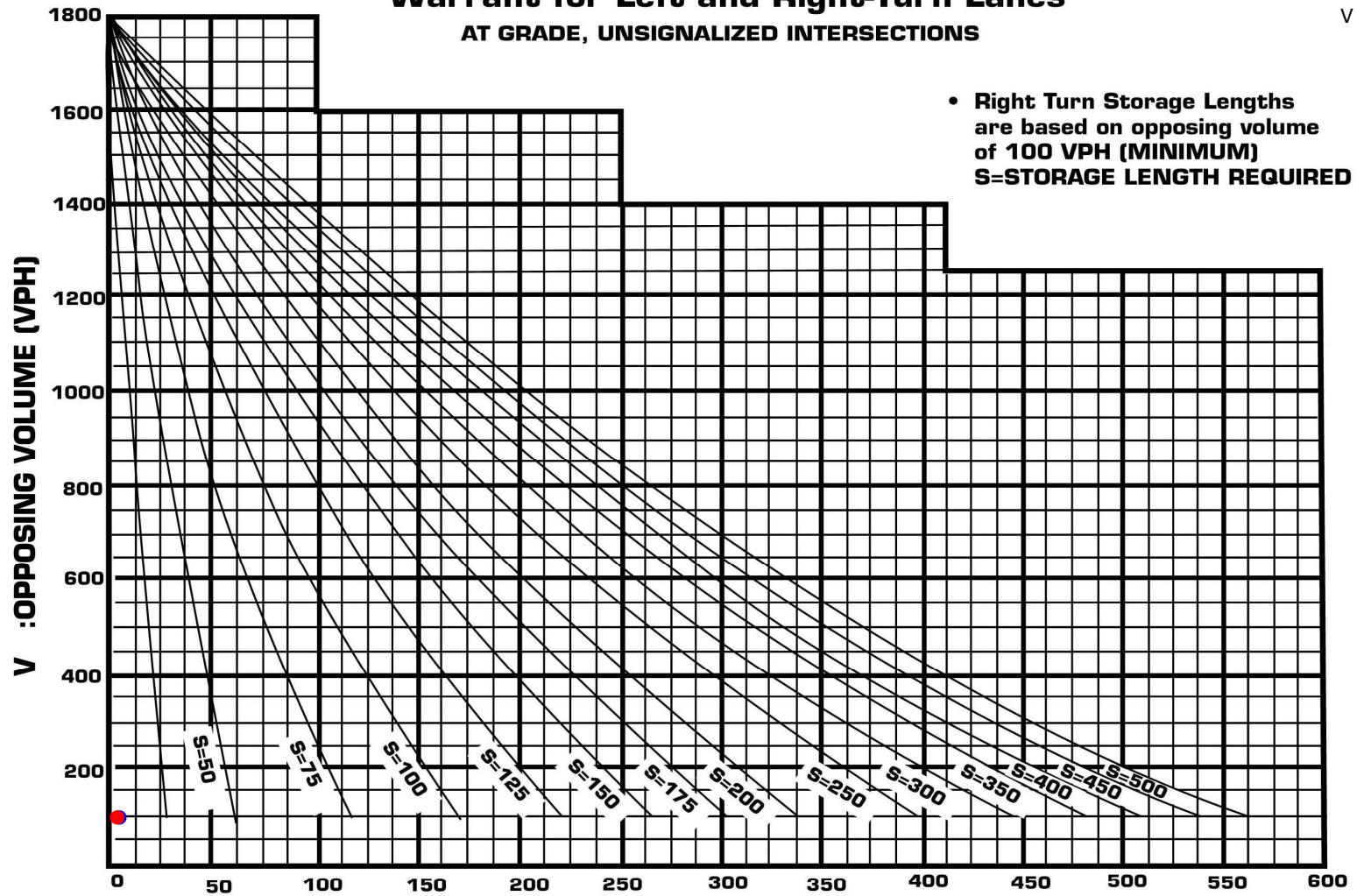
AM Peak Hour

VR = 5
V = 100

PM Peak Hour

VR = 4
V = 100

Warrant for Left and Right-Turn Lanes AT GRADE, UNSIGNALIZED INTERSECTIONS



- Right Turn Storage Lengths are based on opposing volume of 100 VPH (MINIMUM)
S=STORAGE LENGTH REQUIRED

Policy On Street And Driveway Access to North Carolina Highways

V_L: LEFT TURNING VOLUME (VPH)
V_R: RIGHT TURNING VOLUME (VPH)

Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.

Robertson Street / Site Access 4
Westbound Right-Turn
2028 Build AM and PM Peak Hours

LEGEND

- = AM Peak
- = PM Peak

AM Peak Hour

VL = 12

V = 250

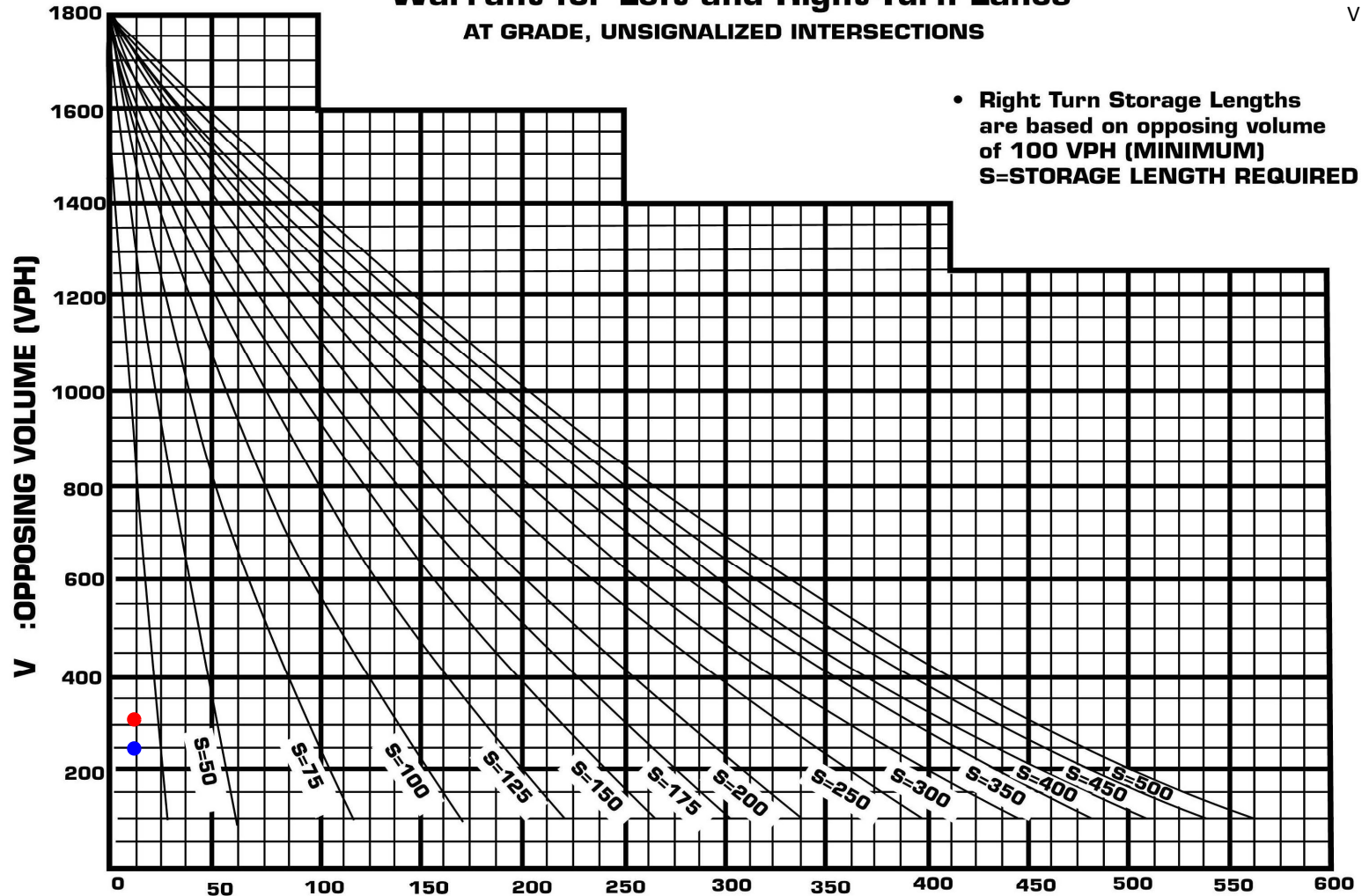
PM Peak Hour

VL = 12

V = 311

Warrant for Left and Right-Turn Lanes

AT GRADE, UNSIGNALIZED INTERSECTIONS



- Right Turn Storage Lengths are based on opposing volume of 100 VPH (MINIMUM)
S=STORAGE LENGTH REQUIRED

Policy On Street And Driveway Access to North Carolina Highways

V_L : LEFT TURNING VOLUME (VPH)
 V_R : RIGHT TURNING VOLUME (VPH)

Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.

Robertson Street / Site Access 5
 Eastbound Left-Turn
 2028 Build AM and PM Peak Hours

LEGEND

- = AM Peak
- = PM Peak

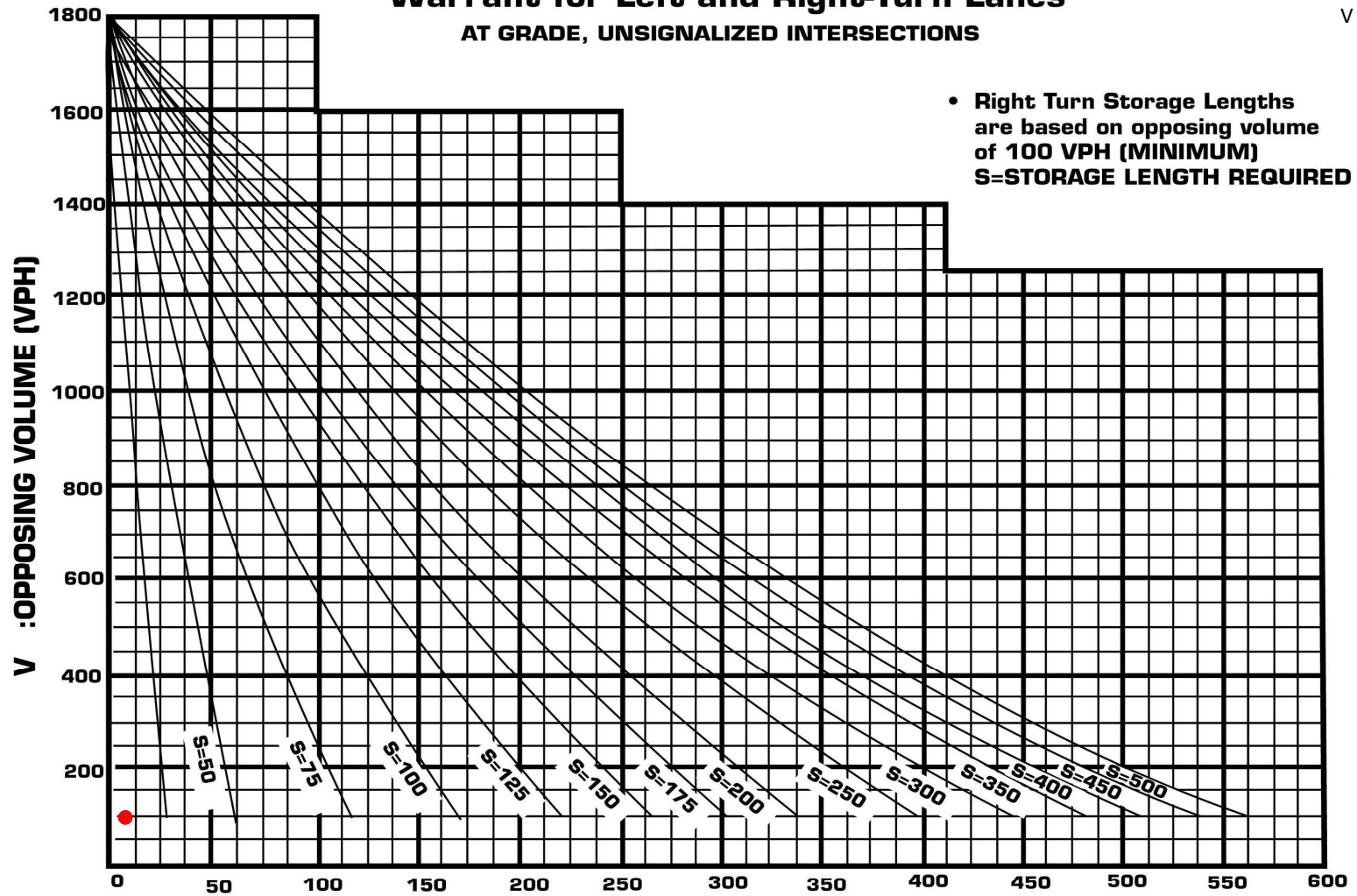
AM Peak Hour

VR = 8
V = 100

PM Peak Hour

VR = 8
V = 100

Warrant for Left and Right-Turn Lanes AT GRADE, UNSIGNALIZED INTERSECTIONS



• Right Turn Storage Lengths are based on opposing volume of 100 VPH (MINIMUM)
S=STORAGE LENGTH REQUIRED

Policy On Street And Driveway Access to North Carolina Highways

V_L: LEFT TURNING VOLUME (VPH)
V_R: RIGHT TURNING VOLUME (VPH)

Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.

Robertson Street / Site Access 5
Westbound Right-Turn
2028 Build AM and PM Peak Hours

LEGEND

- = AM Peak
- = PM Peak

AM Peak Hour

VL = 12

V = 214

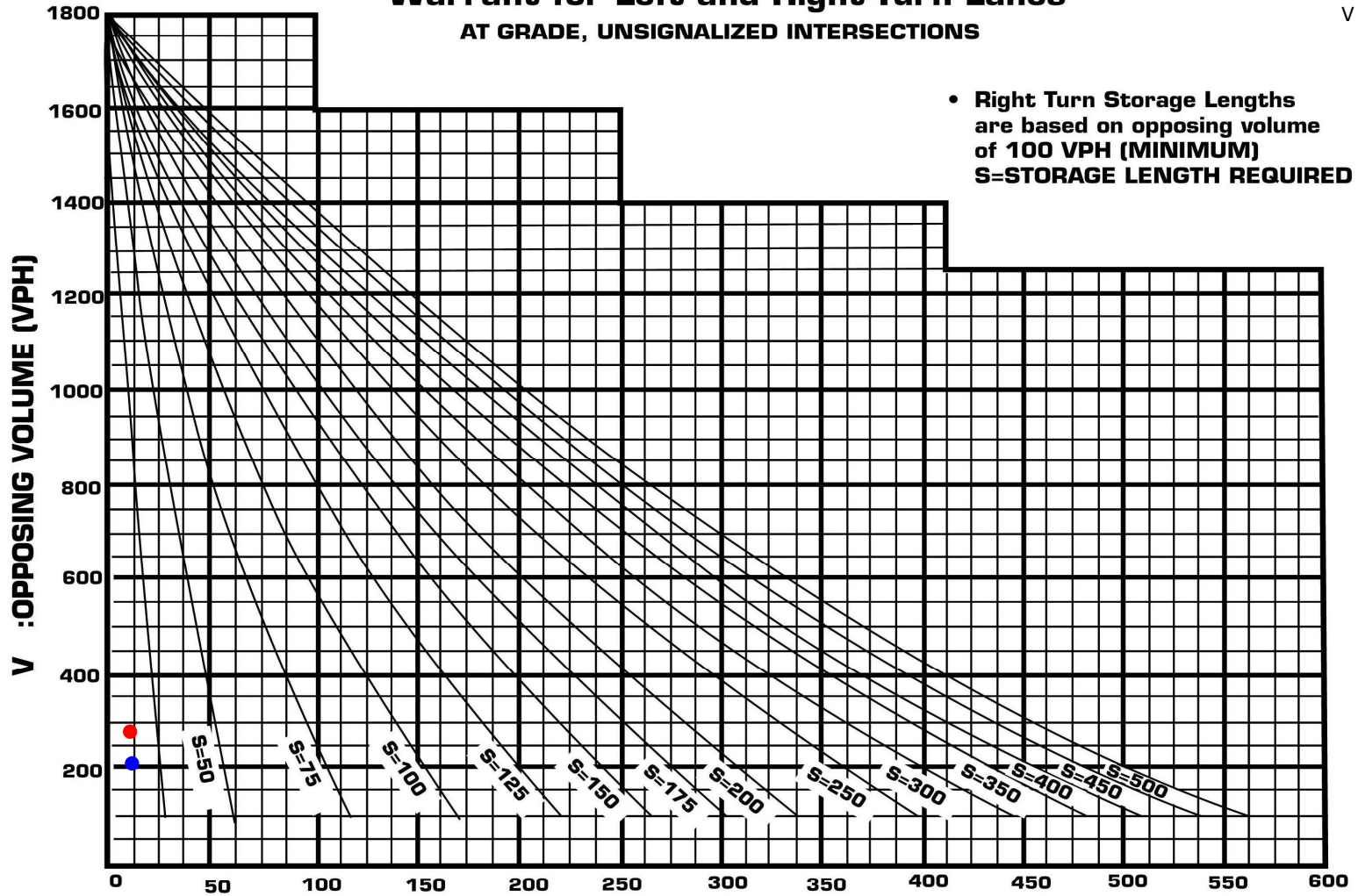
PM Peak Hour

VL = 11

V = 281

Warrant for Left and Right-Turn Lanes

AT GRADE, UNSIGNALIZED INTERSECTIONS



- Right Turn Storage Lengths are based on opposing volume of 100 VPH (MINIMUM)
S=STORAGE LENGTH REQUIRED

Policy On Street And Driveway Access to North Carolina Highways

V_L : LEFT TURNING VOLUME (VPH)
 V_R : RIGHT TURNING VOLUME (VPH)

Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.

Robertson Street / Site Access 6
 Eastbound Left-Turn
 2028 Build AM and PM Peak Hours

LEGEND

- = AM Peak
- = PM Peak

AM Peak Hour

VR = 8

V = 100

PM Peak Hour

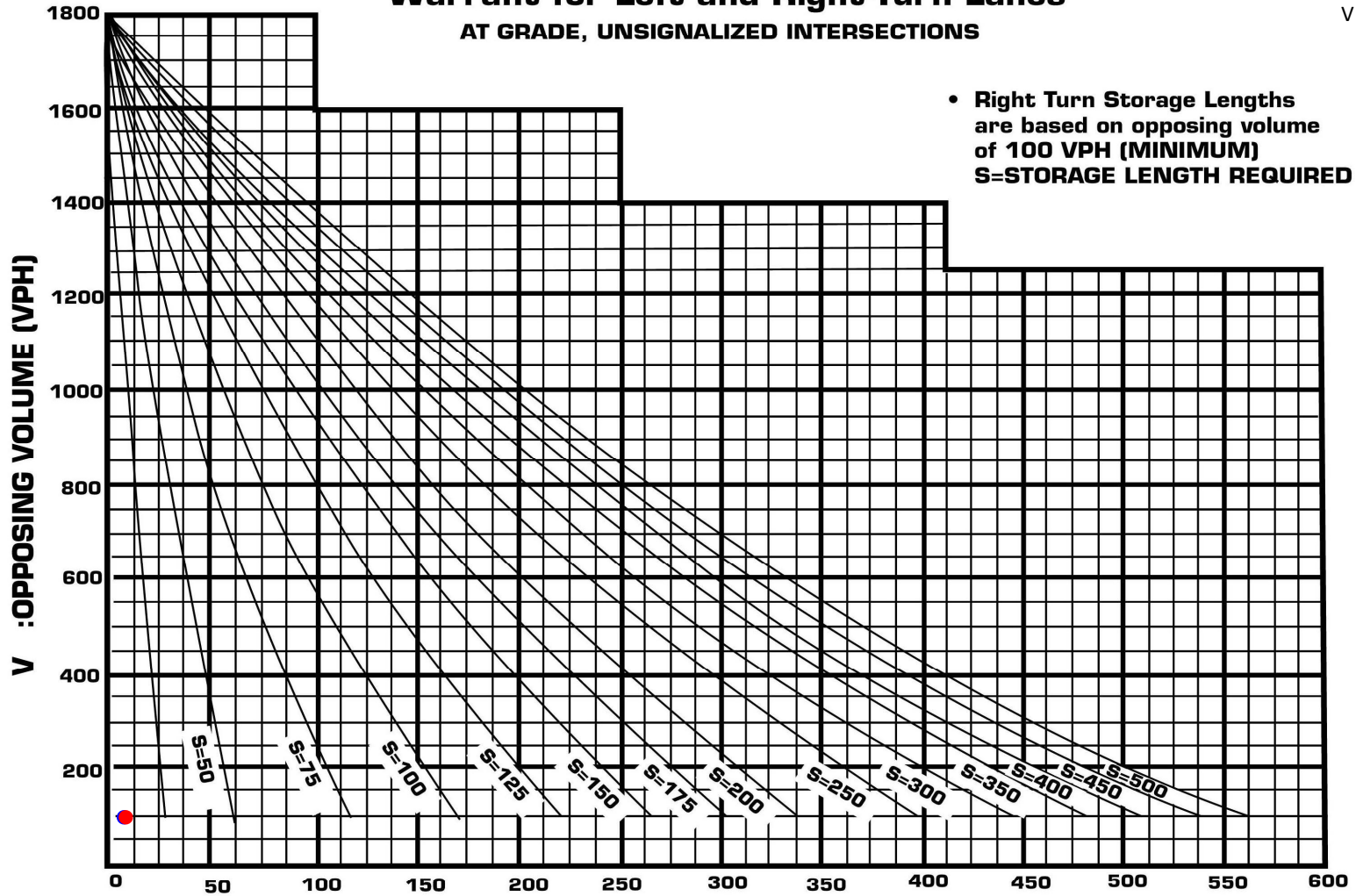
VR = 9

V = 100

Warrant for Left and Right-Turn Lanes

AT GRADE, UNSIGNALIZED INTERSECTIONS

- Right Turn Storage Lengths are based on opposing volume of 100 VPH (MINIMUM)
- S=STORAGE LENGTH REQUIRED



Policy On Street And Driveway Access to North Carolina Highways

V_L: LEFT TURNING VOLUME (VPH)
 V_R: RIGHT TURNING VOLUME (VPH)

Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.

Robertson Street / Site Access 6
 Westbound Right-Turn
 2028 Build AM and PM Peak Hours

LEGEND

- = AM Peak
- = PM Peak

AM Peak Hour

VL = 13

V = 257

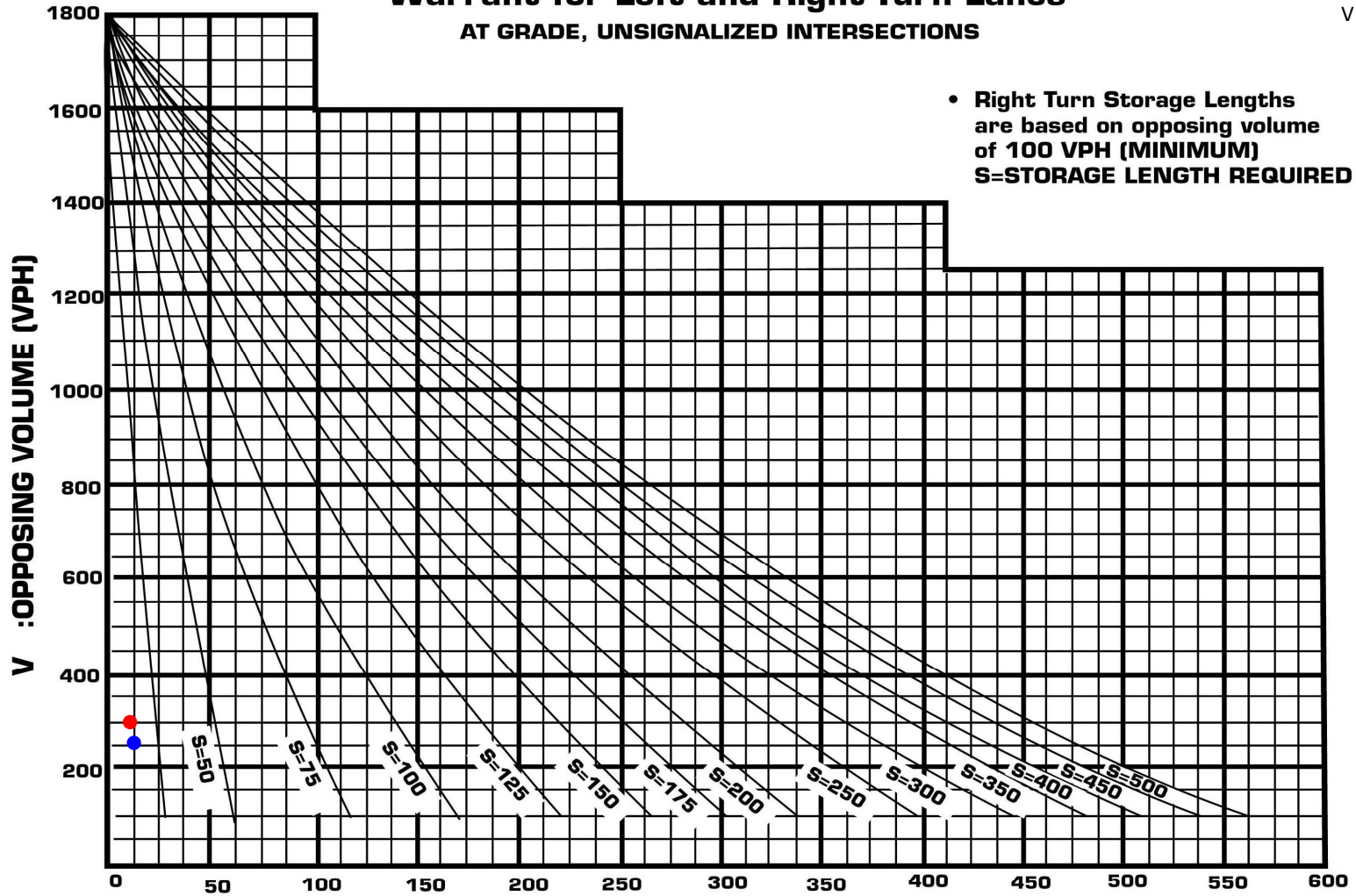
PM Peak Hour

VL = 11

V = 301

Warrant for Left and Right-Turn Lanes

AT GRADE, UNSIGNALIZED INTERSECTIONS



- Right Turn Storage Lengths are based on opposing volume of 100 VPH (MINIMUM)
S=STORAGE LENGTH REQUIRED

Policy On Street And Driveway Access to North Carolina Highways

V_L : LEFT TURNING VOLUME (VPH)
 V_R : RIGHT TURNING VOLUME (VPH)

Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.

Robertson Street / Site Access 7
 Eastbound Left-Turn
 2028 Build AM and PM Peak Hours

LEGEND

- = AM Peak
- = PM Peak

AM Peak Hour

VR = 8

V = 100

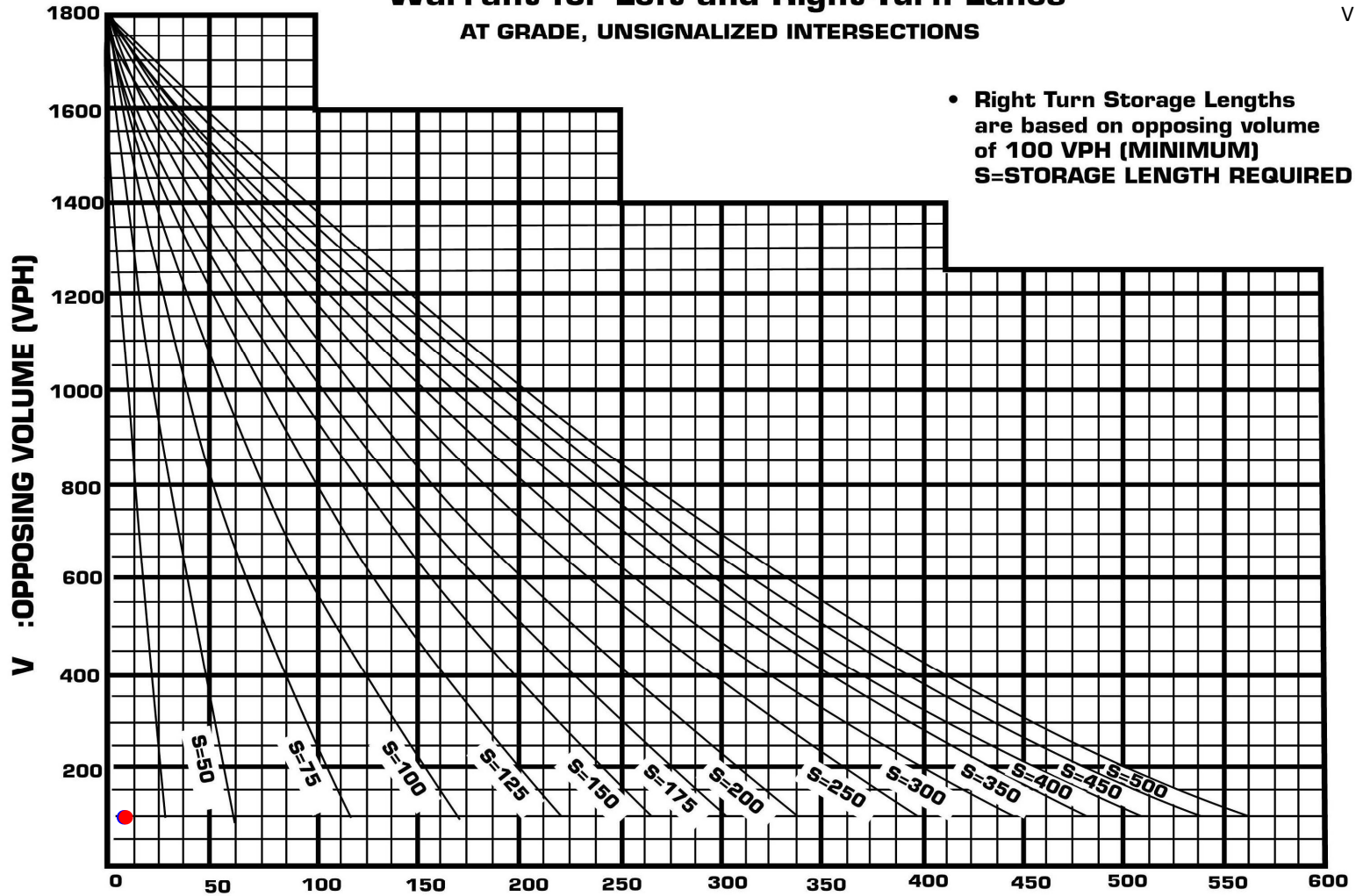
PM Peak Hour

VR = 9

V = 100

Warrant for Left and Right-Turn Lanes

AT GRADE, UNSIGNALIZED INTERSECTIONS



- Right Turn Storage Lengths are based on opposing volume of 100 VPH (MINIMUM)
- S=STORAGE LENGTH REQUIRED

Policy On Street And Driveway Access to North Carolina Highways

V_L: LEFT TURNING VOLUME (VPH)
 V_R: RIGHT TURNING VOLUME (VPH)

Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.

Robertson Street / Site Access 7
 Westbound Right-Turn
 2028 Build AM and PM Peak Hours

LEGEND

- = AM Peak
- = PM Peak